

**GENERAL AND SOCIAL  
PSYCHOLOGY**

*This book is produced in  
complete conformity with the  
authorised economy standards.*

# GENERAL AND SOCIAL PSYCHOLOGY

A TEXTBOOK FOR STUDENTS  
OF ECONOMICS AND OF  
SOCIAL SCIENCES

BY

ROBERT H. THOULESS, Ph.D., M.A.

LECTURER IN PSYCHOLOGY IN THE DEPARTMENT OF EDUCATION  
UNIVERSITY OF CAMBRIDGE

FELLOW OF CORPUS CHRISTI COLLEGE, CAMBRIDGE

AUTHOR OF "AN INTRODUCTION TO THE PSYCHOLOGY OF RELIGION"



LONDON

UNIVERSITY TUTORIAL PRESS LTD.

Clifton House, Euston Road, N.W.1

301.1

N25  
~

11764

*First Published 1925*

*Second Edition (Revised and Extended) 1937*

*Reprinted 1941, 1943, 1944, 1945, 1947*



## PREFACE TO SECOND EDITION

SINCE the first edition of this book appeared under the title "Social Psychology," there has been a great deal of new work on its subject matter which could not be dealt with except by radical revision. The result is virtually a new book considerably increased in size.

Two chapters that are wholly new (xvii. and xxi.) were suggested by criticisms in reviews to whose authors I am indebted. Chapter xxi. deals with statistical methods which are of increasing importance in the social sciences and particularly in that branch of social psychology called educational psychology. In my own teaching work, I have felt the need for a satisfactory elementary introduction to the subject for psychological students, particularly for those who are going to do research in educational or social psychology, and I hope that this chapter will satisfy this need. Chapters xxii. and xxiii. are the Chapter xviii. of the old edition expanded in order to take in the new work on mental testing and factor analysis. Many readers whose interests do not lie in this direction may find Chapters xxi. to xxiii. too technical to be interesting. They can omit them without any loss to the understanding of the rest of the book.

Chapter xvii. has been added to meet the objection that the earlier edition of the book neglected the most important problem of social psychology—that of the nature and interaction of social groups. The class system in modern civilised societies seems to me to be of the greatest practical importance for social psychology and to be strangely neglected by social psychologists. The inadequacies of this chapter must be excused by the fact that it very largely breaks new ground, and its purpose will have been served if it interests social psychologists in these problems and leads to research on them.

Perhaps the most obvious change is the much smaller use that is made of the conception of "instinct." This corresponds to no important change in the author's opinions. At no time did I believe (nor do I think that any responsible social psychologist does believe) that human behaviour is determined by fixed inborn patterns as is the behaviour of such organisms as ants. This is, however, what is often understood by critics of the conception of human instincts and it seems preferable to avoid a term leading to misunderstanding rather than to retain it or some equivalent at the cost of the necessity for repeated explanation to avoid misunderstanding. This change is more desirable since even Professor McDougall who is largely responsible for the retention of the word "instinct" in human psychology has now abandoned it. It has seemed to me to be necessary to go somewhat further than McDougall for reasons explained in the text.

The change of title from *Social Psychology* to *General and Social Psychology* has been made because I think the new title more correctly describes the scope of the book. The work was primarily designed for students of the social sciences, but such students need to have a larger background of psychology than only social psychology. This requirement has been more fully dealt with in the new edition.

I am very much indebted to Dr. R. W. Pickford for the care with which he has read and criticised both the typescript and the proofs, to Professor Burt and to Mr. Chambers for comments on the chapter on "Statistical Methods," to Professor R. B. MacLeod for reading the part of the chapter on "Social Groups" which deals with America, to Miss Vernon for her painstaking correction of the page proofs, and to Mr. Grindley for reading and commenting on the book while it was in proof.

ROBERT H. THOULESS.

Glasgow University.

## EXTRACTS FROM PREFACE TO FIRST EDITION

THE present work is an attempt to cover the syllabus of the Psychology sub-section of Sociology in the B.Sc. (Economics) Examination of London University. This syllabus deals largely with general psychology, and to a lesser extent with the specialised branches of the subject properly described as "social psychology" or "economic psychology." The book therefore ranges widely over the whole field of psychology, developing in greater detail those parts which seem to have the most important bearing on practical problems.

It is hoped that this work may be found to be of value to a wider circle of readers than those who are preparing for the above examination.

My thanks are particularly due to Mr. F. C. Bartlett for his very great kindness in reading the greater part of the typescript of this book and for many criticisms. I am also grateful to Dr. J. T. MacCurdy for reading through the preliminary chapters on Instinct, to Dr. Olive Wheeler for similar help with the chapter on the psychology of Aesthetics, and to Prof. H. Clay and Prof. T. H. Pear, from both of whom I have received valuable encouragement and criticism. I am indebted to my wife and to Miss I. Burnett for the correction of the typescript and the proofs.

R. H. THOULESS.

Manchester University.

# CONTENTS

	PAGE
CHAPTER I. THE SCIENCE OF PSYCHOLOGY ..	I
What is Psychology? Psychology as Science. Pre-Scientific Methods of Psychology. Factual and Verbal Problems in Psychology.	
CHAPTER II. THE INNATE PATTERN REACTIONS ..	20
Pattern Reactions. Tropism. Reflex Action. Instinctive Behaviour. Adaptive Character of Instinctive Behaviour. Relative Invariability of Instinctive Behaviour. Universality Among Members of the same Species. Relative Perfection of First Performance. The Biological Classification of the Instincts.	
CHAPTER III. ACQUIRED PATTERNS OF BEHAVIOUR	
—I. .. .. .	40
Instinct and Intelligence. Spontaneous Variability of Instinctive Behaviour. Modification of Instincts by Learning. The Law of Exercise. The Law of Effect.	
CHAPTER IV. ACQUIRED PATTERNS OF BEHAVIOUR	
—II. .. .. .	58
The Conditioned Reflex. Inheritability of Acquired Behaviour. The Stimulus-Response Formulation of the Laws of Learning. Physiological Explanations of Learning. Human Learning and the Laws of Learning.	
CHAPTER V. THE EMOTIONS .. .. .	74
Emotion. The Sympathetic and Disinterested Emotions. Weakness of Disinterested Emotions called out by Mental Representation. The Expression of the Emotions. The Physiological Mechanism of the Emotions. The James-Lange Theory of the Emotions. Qualities of Feeling. Emotion and Instinct.	

CHAPTER VI. THE SENTIMENTS, THE ATTITUDES, CHARACTER AND PERSONALITY .. ..	96
The Sentiments. Sentimentalism. Attitudes. The Temperaments. Character. Types of Character. Per- sonality. Dissociation of Personality.	
CHAPTER VII. THE FOUNDATIONS OF HUMAN BE- HAVIOUR .. .. .	119
The Problem of Human Instincts McDougall's Classification of Innate Human Behaviour Tendencies. Criticisms of Theories of Human Instincts or Propen- sities. Dynamic Conceptions of Human Behaviour.	
CHAPTER VIII. THE TRANSFORMATIONS OF BE- HAVIOUR TENDENCIES .. .. .	138
Some Social Problems of Behaviour Tendencies. Canalisation. Repression. Deflection. Sexual Regu- lation and Cultural Achievement. Objectification, Subjectification, Idealisation, and Platonisation.	
CHAPTER IX. HUNGER, FEAR AND SEX .. ..	152
Hunger. Fear. Sex. Abnormalities of Sex. The Parental Tendency. Behaviour Tendencies of the Child in the Family.	
CHAPTER X. ACQUISITIVENESS AND PUGNACITY ..	174
Acquisitiveness amongst Animals. Acquisition in Man. Pugnacity amongst Animals. Aggressive Be- haviour amongst Children. Fighting amongst Human Adults War and the Aggressive Tendency. Trans- formations of the Aggressive Tendency. Our Competi- tive Acquisitive Pattern of Culture.	
CHAPTER XI. LAUGHTER, PLAY AND WORK ..	201
The Problems of Laughter. Spencer's Theory of Laughter. Bergson's Theory of Laughter. McDougall's Theory. Freud's Theory of Wit. More Recent Theories of Laughter. The Social Character of Laughter. Con- clusions as to the Nature and Object of Laughter. Play. Work. Incentives to Work. Education for Work. Fatigue.	

	PAGE
CHAPTER XII. THE PERCEPTION OF THE EXTERNAL WORLD .. .. .	224
The Organism and Its Environment. Mental Life. Sensation. Perception. The Gestalt Theory. The Outside World and the World of Appearances	
CHAPTER XIII. THOUGHT AND LANGUAGE—I. ..	245
Behaviour and Thought Imagery. Experimental Investigation of the Thought Processes Language and Conceptual Thinking	
CHAPTER XIV. THOUGHT AND LANGUAGE—II. ..	264
Social Functions of Language. Remembering and Forgetting. Phantasy Thinking The Laws of Association and the Associationist-Hedonist Theory.	
CHAPTER XV. CONFLICT AND VOLITION .. ..	282
Conflict between Impulses. Conflict on the Physiological Level. The Resolution of Conflicts. Conflict in Thought Sustained and Incidental Conflicts. Impulsive and Volitional Action. Strength of Will as a Character Trait. Explanations of Volitional Action. Principles and Ideals	
CHAPTER XVI. SOCIAL BEHAVIOUR TENDENCIES..	304
Basic Factors in Social Behaviour. Suggestion and Suggestibility. Sympathy and Imitation. Specific Social Behaviour Tendencies. The Hypothesis of the Group Mind	
CHAPTER XVII. SOCIAL GROUPING .. ..	323
Social Groups. Group Consciousness. Group Loyalties Social Institutions The Group Leader. Codes of Manner. Social Classes and Social Stratification. The Stability of Social Organisations.	
CHAPTER XVIII. THE PSYCHOLOGY OF MORALITY	346
The Moral Sentiments Social Approval and Disapproval The Social Determination of Morality. Crime and Punishment.	
CHAPTER XIX. THE PSYCHOLOGY OF ECONOMIC VALUE—I. .. .	358
Desire. Desire and Economic Value. The Possibility of Quantitative Expression of Desires, Wants, etc. Individual Valuations. Diminishing Valuation	

	PAGE
CHAPTER XX. THE PSYCHOLOGY OF ECONOMIC VALUE—II. . . . .	378
Market Values. The Psychological Roots of Economic Value. The Psychological Inadequacy of Certain Popular Accounts of Human Behaviour. Social Determination of Values.	
CHAPTER XXI. THE USE OF STATISTICAL METHODS . . . . .	390
Experiment in Social Psychology. The Effects of Sampling. The Standard Error of Sampling. The Significance of a Difference between Two Means. Correlation. Partial Correlation. Reliability of Test Results. Day-to-Day Variation of Mental Functions. Ways of Studying Statistical Methods.	
CHAPTER XXII. MENTAL TESTING . . . . .	416
Individual Psychology. Intelligence Tests. Modern Mental Testing.	
CHAPTER XXIII. INTELLIGENCE AND INTELLIGENCE DIFFERENCES . . . . .	429
What is Intelligence? The Two-Factor Theory. Criticism of Two-Factor Theory. Group Factors. Multiple Factor Analysis. Practical Implications of the Results of Intelligence Testing. Education and Intelligence. Intelligence and Race. Formal Training.	
CHAPTER XXIV. THE PSYCHOLOGY OF AESTHETICS . . . . .	452
Natural Objects of Beauty. Works of Art. Art Production and Appreciation as Social Phenomena. Aims of Art Production. Individual Differences in Response to Works of Art. Sources of Aesthetic Enjoyment. The Nature of Aesthetic Appreciation. Mental Conditions of Art Production. The Place of Conflict in the Appreciation of Art	
CHAPTER XXV. THE PSYCHOLOGY OF SCIENTIFIC AND OF RELIGIOUS DEVELOPMENT . . . . .	477
The Incentive to Scientific Discovery. Scientific Theory and Religion. Religion as a Mode of Adaptation. The Essential Problems of the Psychology of Religion. The Individual Psychology of Religion. Religion and Other Modes of Adaptation.	
BOOK REFERENCES . . . . .	496
INDEX . . . . .	511



# GENERAL AND SOCIAL PSYCHOLOGY

## CHAPTER I

### THE SCIENCE OF PSYCHOLOGY

#### 1. What is Psychology ?

We may define psychology as the *positive science of human experience and behaviour*. By calling it a science, we indicate that its concern is the systematisation of facts gathered by the methods of observation and experiment. It is a positive science (as opposed to a normative study like ethics) because its concern is with facts as they are, and not as they should be. The terms "experience" and "behaviour" indicate two complementary ranges of data with which we are concerned. In the presence of any situation affecting a human being there are two points of view from which we may study what happens to him, that of an outside observer and that of the individual himself. The outside observer may see that the lover blushes at the mention of the name of his beloved, shows restlessness and distraction in her absence, and carries out persistent behaviour to bring himself into and to continue in her presence. The feelings that the lover experiences, the words and images which occupy his thought, and the beauty which he perceives in the face of his loved one (and himself very largely creates in the act of perception) are observable to no one but himself. The psychologist is concerned with both aspects of human activity—behaviour and experience. Both must be studied if we are to gain understanding of human thought and activity.

In some fields of psychological investigation—in animal psychology, for example, and in part of child psychology—we are necessarily limited to the study of behaviour since we cannot question our subjects as to their experiences. In this field, therefore, we are cut off from the study of part of the subject matter of psychology, but we have the compensating advantage that our observations are more like those in the other sciences since behaviour data are more reliable than accounts of experience, less likely to be distorted by peculiarities of the subject tested, and less likely to be influenced by the preconceived ideas of the experimenter. They come nearer, therefore, to the ideal objectivity of scientific experiment as it is found in a physical experiment where the same experimental conditions reproduced by another investigator will inevitably lead to the same experimental result.

For this reason, this type of psychological enquiry has been adopted by many investigators as the sole scientific kind of psychological experiment even for the investigation of adult human psychology. The "behaviourist" school of psychology in its extreme form admits only the study of behaviour as its subject matter. The experimenter may observe the reflexes and other movements of his subject but will not ask him what is passing in his mind. If he records the words of his subject, these will be treated by the more extreme behaviourists simply as behaviour responses of the speech apparatus and not (as common sense would regard them) as indications of what is happening in the subject's mind.

The development of behaviourist methods of experiment and observation has been of great advantage to the growth of psychology. Animal and child psychology have benefited by the development of a technique of enquiry in which behaviour itself was studied and systematised instead of being used as an uncertain foundation for a system of speculations about what was passing through the mind of the animal or child studied. In adult human

psychology too, the more objective methods of study are to be preferred whenever they will give the information we require.

Unfortunately, they do not always do this. The danger of behaviourism, particularly in its more extreme forms, has been its tendency to lead to neglect of some aspects of human response which are vital to understanding. If we study the remembering powers of an animal, we cannot question the animal as to its mental processes, although perhaps we should understand its performances better if we could. If, on the other hand, we are studying the remembering powers of a human being, it is absurd to cut ourselves off from this source of information. Let us suppose that we give a subject a series of nonsense diagrams to look at for a certain time and afterwards reproduce. We assess his power of remembering by measuring the correctness of the reproductions. That is a purely behaviourist experiment and it may lead to useful results. But differences between different individuals may be due to factors which such an experiment does not reveal. On questioning them we may find that one subject reports that he is remembering the diagrams by calling up mental pictures of them, another by thinking of them as resembling various objects, another by noticing their resemblance to the symbols in some system of shorthand, and so on. It is not reasonable to cut ourselves off from this source of information altogether, however much we may recognise the greater reliability of observations of behaviour.

Another weakness of the extremer forms of behaviourism is that they too much restrict what is to be observed in behaviour. As we watch an animal or child we see not only movements but also general tendencies of movements. Thus a dog may be seen to run rapidly to different points of a room sniffing a few times at each before going to the next. Most of us would report that we had seen the dog "looking for something." Is such

an attribution of purpose part of a description of behaviour? Clearly it is less reliable than a mere description of movements since we may be reading into the animal's behaviour interpretations which are our own. It is certainly not possible to tolerate in scientific description of behaviour the amount of interpretation and ascription of purpose which is found in popular descriptions. We ought not simply to say that we saw the dog "looking for something" but to describe also the general characters of his behaviour which led to that interpretation. The most extreme behaviourism would, however, go further and say that we must describe only the details of behaviour and not its general characters. This, however, would result in a behaviour description becoming objective and "scientific" at the cost of also becoming almost completely meaningless.

The dispute between those who would limit psychology to the study of behaviour and those who would also admit introspective accounts of mental processes as part of its subject matter or even as the whole of its subject matter was, a few years ago, a serious one, especially in the U.S.A., the home of behaviourism. It is much less so now. An increasing number of psychologists in all fields recognise the desirability of making their investigations as behaviouristic as possible. On the other hand the ideals of extreme behaviourism—complete ignoring of all introspective evidence and elimination of reference to general characters of behaviour (persuasively upheld by J. B. Watson<sup>285</sup>)—are generally recognised as impracticable and as leading to dangerous and unnecessary impoverishment of psychological study under the pretext of making it scientific.

With the more moderate programme of the behaviourists of the present day, other psychologists can have no fundamental quarrel. They have their own field of investigation and their own methods, but the ultimate aims of psychology are only to be attained by the development

of many different methods and each of us can only hope to be an investigator in a limited field of our large subject.

The existence of different schools of psychology is not necessarily evidence of divergent aims, but of necessary specialisation of research. The student must know something of the work of all schools and must understand the technical language of each. National and local antagonisms and the individual ambitions of psychologists may exaggerate the differences between these schools. They are best understood if we see them as converging approaches to the same aim of the scientific understanding of human thought and behaviour.

## 2. Psychology as Science

In all sciences, common everyday observation was a source of knowledge before experiments were performed in laboratories. Men knew much of inertia and of forces by handling, throwing and stopping missiles, before the science of dynamics was based on an extension of these observations by careful laboratory measurements of masses, velocities and accelerations. Similarly, much was known of human behaviour and experience before psychological laboratories started their work during the last century. Yet laboratory experimentation and the controlled observations of the trained psychological observer have as important a part to play in the building up of a scientific psychology as that of laboratory experimentation in physics. In regions (such as the study of perception, of learning, etc.) in which a body of experimental knowledge has been gathered, any system of psychology which ignores this body of facts proclaims itself to be a psychology of yesterday.

There are other regions (as, unhappily, a great part of social psychology) where we are still largely dependent on common observations because the body of knowledge obtained by scientific methods is still incomplete. This is

the result of the immaturity of our science. It is to be hoped that, in the future, this incompleteness will disappear and our knowledge of human behaviour in all fields will have been ordered and systematised by psychological experiments and observations in fields where this has yet hardly been attempted. Until then we must explain social behaviour as well as we can in the light of common observation and of so much scientific knowledge as we have.

It is necessary to remember, however, that such hypotheses as we form must be tentative, and that, when we are in regions in which we have nothing except common observation to support us, the fact that we call ourselves psychologists gives us no more right to put forward our explanations authoritatively than anyone else has. Where the psychologist has special authority is where he builds his conclusions on experimental or observational evidence not known to the man in the street. An assumption of special authority when they are merely speculating on the basis of facts known to everybody has done much to discredit psychologists.

Science is not, however, the mere gathering of facts. Its most important work is the formation of general postulates each of which is explanatory of a large number of facts, and may be used as a method of predicting facts hitherto unobserved. A postulate which is confirmed by a large number of facts and contradicted by none, and which has been confirmed by its power to predict truly new facts, is a general law of science. Thus the law of gravitation includes all the facts connected with the falling of bodies towards the earth, the effect of their mutual attractions on the motions of heavenly bodies, the movements of pendulums, the displacement of plumb-lines in the neighbourhood of mountains, etc. When a fact can be shown to belong to a class of facts all of which are examples of a general law, it is said to be explained. The object of science is thus the ordering of the myriads

of separate facts in the Universe under a relatively small number of laws. If we know these laws, we can predict and control the separate facts which are examples of the laws.

If this is recognised to be the ultimate goal of all science, it should be clear that psychology has advanced only a little way towards this goal. We have a multiplicity of facts about experience and behaviour but few laws about which we can feel at all certain. The science of psychology is now at a stage at which we can form tentative postulates which serve to explain a certain range of facts but which may be expected to require modification as new facts are discovered. There is not even universal agreement as to what postulates are to be adopted. This is to be expected in a growing science, but it is confusing to the student.

It is likely to be a long time (perhaps centuries) before psychology becomes a system of general laws universally accepted and generally valid for prediction. It is now a science in the process of being made. In this process of making, however, important advances have been and are being made. Clark Hull has shown how the process of forming postulates which are the basis of successful prediction can be carried out in the very limited field of the memorising of nonsense syllables. The Gestalt psychology has put forward postulates in the field of perception which are successful in that field.<sup>132</sup>

Systems of hypothesis intended to co-ordinate larger fields commonly do not command any general acceptance. McDougall's explanation of human behaviour by the theory of instincts,<sup>133</sup> Freud's theory of the Unconscious,<sup>79</sup> and the Gestalt theory<sup>130</sup> have all roused fierce controversy. There is no reason for seeing in this controversy a hopeless confusion in psychological theory which indicates that it will never become a complete body of science. It is rather to be regarded as a symptom of the early stage of development of psychological science, in which hypotheses are first forming themselves out of the chaos of crude facts.

correspond to the observations of animal behaviour made by Thorndike,<sup>238</sup> Köhler,<sup>183</sup> and a host of others on the actual achievements of animals which replaced the anecdotes of untrained animal lovers.

There is another pre-scientific method related to anecdotalism for which there seems to be no recognised name so I propose to call it "fantastic anecdotalism." It is the use of an anecdote which is not an account of an actual event but of one invented by the writer for the purpose of his argument.

Thus when James Mill wanted to give an example of the process of thought he said:<sup>185</sup>

"I see a horse: that is a sensation. Immediately I think of his master: that is an idea. The idea of his master makes me think of his office; he is a minister of state: that is another idea. The idea of a minister of state makes me think of public affairs; and I am led into a train of political ideas; when I am summoned to dinner. This is a new sensation, followed by the idea of dinner, and of the company with whom I am to partake it. . . ." (Chap. III.).

This does not appear to be a genuine account of what Mill observed to pass through his mind when he actually saw a horse. I may be unjust to Mill, but I suspect that it is an account of what he thought, when sitting in his study chair, would have passed through his mind if he had really seen a horse. If this suspicion is correct, this is not a genuine introspection but a mere fantastic anecdote.

Similarly a writer on psychology who, in the course of a discussion of the James-Lange theory of emotion, said: "A madman presents a pistol at me" was using this method of fantastic anecdotalism. We can be reasonably certain that no madman has ever presented a pistol at the psychologist. He was merely guessing about the nature of the emotions he would have had if a madman had done so. From such guesses, scientific conclusions cannot be validly drawn. This may seem to be too obvious to be worth



emphasising but if a careful examination of psychological books of the pre-scientific period be made, a surprising number (by no means all) will be found to base many of their conclusions on such fantastic anecdotes. Principles of Association of Ideas were based on fantastic anecdotes of processes of thought, and theories of perception were based on fantastic anecdotes of the perceptual experiences of a blind boy with one finger, while Condillac based a theory of sensations on fantastic anecdotes of a statue which had only a sense of smell.<sup>61</sup>

Anecdotalism itself is of limited or transient use to a scientific psychology; it may be justified either as illustration or as preliminary to scientific investigation. Fantastic anecdotalism, on the other hand, while it may perhaps sometimes be justified as illustration (for which purpose it is often very misleading), can never be a proper method of supporting a conclusion, not even a preliminary method of supporting a tentative conclusion. The use of fantastic anecdotalism is a vice which must be avoided by any investigator whose aim is scientific, to whatever school of psychology he may belong.

An illegitimate use of speculation must also be classed with the methods which scientific psychology rejects. The foundations of scientific method were laid when men turned from the use of speculative reasoning as a source of information about the natural world and applied themselves instead to the study of facts. That is, they no longer hoped to find out by intellectual processes of thought what must be, but to discover, by examination of reality, what is. In the scientific field, speculation had proved an uncertain guide. Men's reason told them that bodies fell with velocities proportional to their masses but experiment proved they did not. The speculative method led them to the conclusion that a vacuum was impossible but experiment succeeded in making it.

To assert that speculative methods are unable to determine what is true and what is false in nature is not,

however, to deny all value to speculation in science. Speculative intellectual thought has a function of high importance, that of suggesting what may be. What actually is must afterwards be decided by experiment and observation. Every suggested hypothesis which seeks to order a variety of facts under a single law is, at the beginning, an act of theoretical speculation. The ability to speculate well is of at least as great importance to the advance of our science as is the ability to experiment well and it is probably rarer. Wertheimer's bold speculations which formed the theoretical basis of the Gestalt theory are a good example of speculation which has borne fruit in a rich harvest of experiments on perception, many of which have elucidated problems which could not even have been formulated without the theoretical guidance of the initial speculation.<sup>132</sup>

More ambitious and less controlled by the discipline of intellectual method are the speculations of Freud in his psycho-analytical theory.<sup>33</sup> Although these speculations may have great value as a practical guide in the treatment of psycho-neurotic patients, their value to theoretical psychology has been greatly reduced by the disinclination of both Freud's followers and of his critics to test the truth of his hypotheses by exact experiment and controlled observation and also by a certain lack of system in the hypotheses themselves. This lack of system sometimes leads the critics of this theory to fail to appreciate the importance of the facts asserted by the psycho-analysts, when their real quarrel is with the way in which they are stated. For example, if it is true that, before the age of five, a boy experiences a passionate love for his mother which colours his later emotional development, this is an important fact in developmental psychology whether or not we agree with the implications of such phrases as "Oedipus complex" and "infantile sexuality" by which Freud describes it. The statement that infantile relationships with the parents do determine later emotional

development in such respects as choice of a mate, and attitude towards authority, is clearly a proposition that could be properly tested by statistical evidence. Instead of this having been done, it has been supported by mere anecdotes and refuted by opposed anecdotes. Freud has probably made a great contribution to our knowledge of the human mind, but it is merely the raw material of a scientific psychology. The testing out of his propositions and the systematising of his speculations will be the work of many years.

Sound speculations, ordering already gathered experimental data and providing a guide to new experimentation, are as necessary to psychology as they have been to the physical sciences in the past. It is often more difficult to think of a right theory than to perform experiments to test its rightness when it has been thought of. It is unlikely that we have even the language in which we could state the psychological hypotheses that will seem to be adequate in a hundred years' time. There is, then, much room for the legitimate exercise of speculation in psychology. Speculation only becomes harmful in the development of science when it abandons the role of suggesting possibilities and usurps the function of determining what are the facts.

Since psychology is a relatively young science this harmful use of speculation is relatively common in it. When alternative explanations present themselves, it is easier to decide between them in an arm-chair than by means of a laboratory experiment which may prove arduous and inconclusive. An alert and active intellect may derive much pleasure and some fame by defending speculative theories by argument. Lacking the humility and patience (and perhaps even the experimental technique) for testing his theories in the laboratory, many a student of psychology is led along the primrose path of speculation. His contributions to the subject are only likely to increase the present confusion without advancing

knowledge. Instead of helping to settle existing problems, he contributes intellectual puzzles which may entertain the academic mind but have no significance for the understanding and control of human experience and behaviour.

#### **4. Factual and Verbal Problems in Psychology**

The systematic student finds it necessary to develop some method to enable him to decide which of the many problems discussed in his subject require his serious attention and which are merely the litter of past speculations. William James gives an example of a hunting party who were divided by a bitter controversy as to whether, if a man went round the trunk of a tree with a squirrel keeping always the opposite side of the tree, the man would or would not have gone round the squirrel.<sup>114</sup> He was able to bring peace to the party by pointing out that their difference of opinion did not turn on any difference of fact as to the relative motions of man and squirrel but only on two different ways of using the phrase "to go round." If it were defined in one way, the man could truly be said to have gone round the squirrel, but if defined in the other way, the statement would be false.

The question in dispute was a "verbal" and not a "factual" one. The essence of the dispute lay in the failure to recognise its verbal character so the problem was argued as if it were factual. The hunters thought that they were differing on the actual nature of the man's motion relative to the squirrel and not on how they should use a word.

A dispute of the same order may be found between two psychologists discussing the nature of intelligence. One says that intelligence is "general ability" while the other says that it is "insight." They may discuss this question as if it were one of fact, but it is clear that it is really a question of how the word "intelligence" is to be used. No experiment and no observation could settle the

problem in dispute. It is not a factual problem but a verbal one.

That such a dispute as this is an idle one is not because it is verbal, but because the disputants fail to recognise its verbal character and treat the matter in dispute as if it were a question of fact. It is plainly very necessary that verbal questions should concern the psychologist. We may not always have agreement as to the manner in which certain words are to be used in psychology (although this also is desirable) but we must indicate precisely in what sense we are going to use them. One of the causes of meaningless discussion is the use of vague and ill-defined terms. The habit of definition is a useful safeguard against this tendency. If, amongst some scientific thinkers at the present day, the defining of terms is regarded as a habit of bad reputation, this is only because speculative thinkers have sometimes used definition as a method of deciding facts and not merely of making clear the senses in which words are being used.

Proper use of the method of definition is very necessary if we are to avoid verbal confusion in psychological discussion. In order to define what we are talking about, we must answer two questions: (1) to what general class does it belong? and (2) what is an important distinguishing mark by which it differs from all other members of the same class? If our definition answers these two questions clearly, it is impossible for any one to misunderstand our use of the term defined.

Thus we might define a whale as "a marine mammal that spouts." "Marine mammal" is the general class to which the whale belongs; its habit of spouting distinguishes all whales from all other members of the same general class. Similarly, we may define "intelligence" as "innate capacity to learn." It is then clear what we are talking about. The general class is that of "innate capacities." But there may be many innate capacities: to learn, to behave efficiently without learning, to grow,

to produce offspring, etc. The particular innate capacity to which the word "intelligence" is to refer is the innate capacity to learn.

Another psychologist may, of course, say that he is going to use the word "intelligence" in a different way, and put forward another definition. Provided we both understand the sense in which the other uses the word, there need be no dispute as to facts between us. The same facts will be expressed in different words if the words are used with different meanings. We may claim that ours is the more generally accepted meaning. There is no absolute sense in which we can claim that our meaning is the right one. We may appeal to the dictionary, but we must remember that the better the dictionary, the less use it will be for settling verbal problems; the *Oxford Dictionary*, for example, tries to give all ways in which words have been used and if our opponent has adopted an entirely eccentric and individual way of using the word "intelligence," which he succeeds in persuading some other people to copy, his use of it will ultimately find its way into an appendix of the *Oxford Dictionary*.

A bad definition, on the other hand, simply leaves us uncertain as to what the writer is talking about, and we cannot be sure whether he differs from us in fact or only verbally. When an educational psychologist says, for example, that intelligence is "best defined as a function of the central nervous system," he gives us little guidance as to what meaning he attaches to the word. He has told us that it belongs to the general class of "functions of the central nervous system" (a wide and rather indefinite class) but he has not told us in what way it is to be distinguished from other functions of the central nervous system. He has not defined "intelligence" at all.

It should be noted that a definition need not mention all the important characteristics of what is defined. It has only the limited function of distinguishing the thing defined from all other things, so that there may be no

doubt as to what is being talked about. Our definitions of whales and of intelligence omit many important facts about the objects defined which it would be necessary to mention in a description of them. Definition is not description.

Also it may be noted that there are other ways than definition of indicating what a word means. We might say, for example, that animals are such things as rabbits, fishes, birds, etc., or that "perception" means such activities as seeing, hearing, smelling, etc. The use of this method of indicating the meaning of a word assumes that the common property of the class designated will be made clear by simply enumerating some members of it. Often this assumption is justified, and the method avoids some of the difficulties and obscurities of definition of an abstract term, but it has the disadvantage that it does not indicate the limits of what is defined. The above accounts of the meaning of "animal" and "perception" might, for example, leave the student doubtful whether a sea-anemone was an animal and whether the activity of imaging was perception.

Verbal problems have their own important place in psychological work. It is necessary, however, to learn to recognise their nature, so that they may not be treated as factual problems. If this is done, much of the lumber of psychological controversy may be cleared away. The current controversy as to the existence of human instincts is, for example, largely verbal. It is only when the verbal differences between the disputants are cleared up that we can see plainly the residuum of difference as to matters of fact which divides them. This difference, though real, is much less than appeared at first sight and less difficult to resolve.

The scientific psychologist tries to recognise the true nature of verbal problems and to avoid the error of treating them as factual ones; *meaningless* problems he wishes to avoid altogether. A meaningless proposition is one

which leads to no difference in the realm of observable or possibly observable facts whether it is true or false and yet is not stating something about the use of words. Thus a meaningless statement cannot reasonably either be affirmed or denied. It is less easy to be certain as to what statements in psychology belong to this class. The problem of whether the mind occupies space seems to me to be quite meaningless. If, in the future, someone discovers some observable fact which depends on whether or not the mind occupies space, the opinion that it is meaningless will be proved to be wrong. Often, of course, there are insuperable practical difficulties in making an experimental test of a truly factual problem (as of many of the problems of the effects of nature and nurture in the human child). Such problems are not, for this reason, to be regarded as verbal or meaningless.

It is not always easy to disentangle verbal and factual elements in a problem, and still less easy to decide with certainty that an apparent psychological problem is a meaningless one. The habit of asking, when faced with any proposition, "What observable fact would be different if this proposition were true or false," is one that will always be found a useful guide. It enables us to decide which are problems that we can hope to settle by experiment or observation, which are problems that will disappear when we have agreed as to our use of words, and which are problems that it is useless for us to waste time on at present, even though it is remotely possible that they may appear less meaningless to scientific enquirers of the future.

The goal at which modern psychology is aiming is the establishment of a scientific psychology—that is, the formation of a body of hypotheses which will enable us to understand and control human behaviour and experience. Psychology does not become scientific by adherence to any particular school. The schools of psychology are very largely different traditions of method and interest



pursuing the same goal. In all of them, we can see the attempt to replace anecdote and fantastic anecdote by the results of experiment and controlled observation. In all of them, there is a turning away from speculation and from verbal and meaningless disputations. All fruitful modern schools of psychology are converging towards the one aim of building up the science of psychology.

## CHAPTER II

### THE INNATE PATTERN REACTIONS

#### 1. Pattern Reactions

When we study the behaviour of men, or more strikingly when we study the behaviour of lower animals, we notice that a number of systems of consecutive actions are carried out in a more or less invariable manner. Examples are to be found in the actions of a chick drinking, a man shaving, or in the blinking of the eyes when an object is brought rapidly towards them. A general name for these more or less uniform actions is *pattern reactions*.

Some pattern reactions are individual possessions acquired during an individual's life, such as habits (*e.g.* shaving); others are common to all members of the same species, such as instinctive and reflex modes of behaviour (*e.g.* the instinctive action of the chick drinking and the reflex act of blinking). To account for such complex pattern reactions as habitual and instinctive behaviour, we postulate permanent psycho-physical dispositions.\* Of these dispositions, some are acquired by the lasting effects of the individual's previous behaviour or by the action on him of the influence he receives from his environment; others are innate, belonging to all members of the same species. It will be convenient to consider first those pattern reactions which have an innate disposition as their basis. Three kinds of these have been described: tropisms, reflexes, and instincts.

\* It must be remembered that the dispositions cannot themselves be observed. All that we can observe is behaviour, and that there are certain patterns of behaviour which are very nearly the same in different individuals of the same species. The existence of dispositions is the hypothesis we form to account for these observed uniformities.

## 2. Tropism

The tropism is the simplest form of adaptive (or useful) reaction, distinguished by the fact that it is rigidly determined by the direct action on the organism of physical or chemical stimuli. Such reactions are to be found in plants whose roots grow downwards in the direction of the Earth's gravitational field (positive geotropism) and whose leafing stems grow towards the light (positive heliotropism). The tropism has also been suggested as the movement mechanism of simple animal organisms. Unicellular organisms (such as the Protozoon *Euglena*) are found which swim towards a light, and other organisms (such as the larva of the blow fly) move away from light to darkness. These have been called positively and negatively phototropic respectively.

These differences are explained in the theory of tropisms by supposing that light shining on one side of a positively phototropic protozoon makes the locomotor organs on this side contract less strongly than those on the opposite side.<sup>148</sup> The animal is thus directed towards the light and, when it faces it, continues to swim in that direction because the light, shining equally on both sides of the animal, has no further tendency to change its direction.

It should be noted, however, that careful observers have been by no means satisfied that the tropism is a principle adequate to explain the conduct even of the simplest organism. H. S. Jennings<sup>120</sup> gives accounts of observations of individual animalculæ moving under the influence of warmth or of light. These seem to show that the simple tropistic formula given above appeared to earlier observers to be adequate only because they observed the end result of the stimulus (swimming to or from it) and neglected the steps by which this end was attained. For example, the Protozoon *Oxytricha fallax*, which swims from hot or cold water to water of a moderate temperature, shows no such simple turning movement as is assumed by

the tropistic theory. If the movements of individuals are carefully examined, it is seen that, when the temperature of the water in which they are swimming rises (or falls), they make rapid movements, reversing their direction of progress, backing, and turning to the right. They are thus rapidly scattered, and collect in the part of the water of moderate temperature because when they reach this part they cease to give the reaction and therefore continue to swim forwards. Their behaviour suggested to Jennings a type of reaction which he has called "trial and error" behaviour.

The same observer has also reported varying responses of a very simple organism to the same stimulus, thus showing that the physiological condition of the organism plays a part in determining the response, and that the resultant behaviour is not merely a mechanically determined product of the stimulus. When, for example, water mixed with carmine particles is allowed to reach the disc of the Protozoon *Stentor*, this animalcule shows the following reactions: (1) it begins by not reacting at all, (2) it turns over several times into a new position, (3) then it momentarily reverses the ciliary current, (4) next it contracts strongly and repeatedly, (5) it contracts for a longer time, and, (6) becoming detached from its base it swims away.<sup>119</sup> Since the stimulus remains the same throughout these reactions, it is clear that what changes is the condition of the *Stentor* itself.

Jennings has also described complicated chains of behaviour in *Amoeba*, including the pursuit, capture, and ingestion of one *Amoeba* by another, the escape of the captured *Amoeba*, its recapture and final escape.<sup>120</sup> These seem impossible to explain by any formula of mechanically determined response to stimulus, and seem rather to show a primitive form of purposive adjustment to a goal such as is found in a more fully developed form in intelligent action.

### 3. Reflex Action

The reflex is also a simple innate pattern reaction in which a movement of a serviceable kind is carried out. It differs from the tropism in the fact that it is a response in which conduction of an impulse along nerve fibres plays an essential part. Examples are to be found in such reactions as blinking the eyes when an object approaches them, sneezing when there is irritation of the inner membrane of the nose, the dog's scratching when he is stimulated anywhere over a saddle-shaped area on his back, or the dilatation and closing of the iris of the eyes in dim and bright light respectively.

It will be noticed that these are all responses of a part of the organism to a stimulation produced by something in its environment, and that the response is serviceable to the organism. Blinking protects the eyes from a noxious contact, sneezing and the dog's scratching are methods of removing the object making the contact, while the changes in diameter of the iris keep fairly constant the amount of light admitted to the retina under different conditions of external illumination. Some of these reactions come normally into consciousness and are to a large extent under conscious control (*e.g.* the sneeze), while others cannot be made the objects of introspective observation and cannot be controlled (*e.g.* the adaptations of the diameter of the iris).

"Reflexes" are defined by Sherrington as follows: "reactions, in which there follows on an initiating reaction an end-effect reached through the mediation of a conductor, a nerve itself incapable either of the end-effect or, under natural conditions, of the inception of the reaction."<sup>14</sup>

Physiologically, reflex action requires at least three different structures—an organ for the reception of the stimulus (the *receptor*), a conducting nerve path leading to the organ at which the reaction takes place (the *conductor*), and the organ, muscle, or gland which reacts (the

effector). A single reflex taken apart from all other reflexes is called a *simple reflex*, and the three structures (receptor, conductor, and effector) activated in the simple reflex are called the *reflex arc*.

The fact that many reflex actions are not only present to consciousness but are under conscious control shows that the physiological structure of these reflexes is not so simple as the above scheme suggests, but that the reflex arc must have also an alternative path to the brain. That this is not the sole conducting path of the nervous impulse of the reflex is shown by the fact that the reflex response may persist after transection of the nerve fibres passing to the brain from the spinal cord. For example, a spinal dog (*i.e.* a dog on whom this operation has been performed), displays the scratch reflex when stimulation is applied to a certain area of his back. This reflex response is more automatic and invariable in character than would be the response obtained by the same stimulation from a normal dog.

Sherrington points out that the simple reflex is a somewhat artificial abstraction, for no reflex arc functions as an independent mechanism. The nervous system works as a whole. The integration of various reflex mechanisms into the complex machinery of the whole nervous system below the cerebral cortex is the subject of the volume to which reference has already been made: *The Integrative Action of the Nervous System*.<sup>214</sup>

A step in this integration which has attained importance in general psychological theory is the formation of what have been called by Loeb chain-reflexes (*Ketten-reflexe*).<sup>146</sup> These are regular successions of reflexes which result from the fact that the performance of the first reflex action brings about the stimulus for the second, and so on. Thus the visual stimulus of a fly causes the darting out of the toad's tongue; if successful this produces the contact with the inside of the mouth which is a stimulus producing a

reflex closing, followed by swallowing. So the responses, darting out of tongue, closing of mouth, swallowing, are a chain of reflexes connected together by the fact that the performance of each brings about the stimulus which leads to the next. The conception of chain-reflexes is of interest in psychological theory because attempts have been made to explain as chain-reflexes the more complex series of actions which make up instinctive behaviour.

To this explanation there are two objections. First, it ignores a fundamental character of instinctive behaviour—that it is determined by the end to be attained and not by preceding stimuli. We may take as an example the undoubtedly instinctive nest-building behaviour of birds. There is no single reflex response which the bird exhibits when it has a straw or twig in its mouth. It may make one or another set of muscular movements according to the state of completion of the nest. Its movements are not determined by the preceding stimulus but by something in the future, the aim of completing a nest of the kind customary to its species. The same argument applies to a cat hunting for a mouse or any other kind of instinctive behaviour. Behaviour determined by an end to be attained is called *purposive behaviour*. It is to be noticed that the *purposiveness* of behaviour is a character apparent to the observer of the behaviour, it does not imply any speculation as to the state of mind of the animal displaying it. Indeed it seems reasonable to suppose that an animal carrying out an instinctive action for the first time may have no awareness of the end which its action will achieve. The chain reflex theory which treats an instinctive action as determined by past stimuli and not by future ends ignores this purposive character of instinctive behaviour.

There is a second objection which applies also to all extension of the conception of reflex beyond the simplest responses. Let us suppose that we describe a blow struck by an insulted man as the result of the functioning of a reflex arc in which the sound of the word "idiot" was

an auditory stimulus to which the subsequent contraction and extension of the man's right arm was a reflex response. We should plainly be misrepresenting the situation by over-simplification. The word "idiot" is not carried to the brain by a different nerve tract from that used by any other speech sound and whatever tract it used is certainly not (as in a reflex response) necessarily connected with the nerve tract to the arm muscles. The same word in another context might have produced a response in a different part of the body or none at all. The falsification has taken place through the unjustifiable use of the word "stimulus" for the specific character of the insulting word, and of "reflex" for the response to it.

Such a description would obviously be nonsense, but it may not be so clear that the same objection applies (as was pointed out by Koffka<sup>181</sup>) to such a statement as that the visual stimulus of a fly produces a reflex darting out of a toad's tongue. The stimulation of the toad's retina by the fly does not occupy some particular tract in the optic nerve which is connected as a reflex arc with the tongue muscles. The response may be called out when the fly is in different positions or at different distances, so that different parts of the retina must be stimulated and the stimulations conveyed by different tracts in the optic nerve. Also, whatever tract conveys the sensory impulse might have been stimulated by some other object and have called out no such response. If the object, for example, had been a bee and the toad had previously been stung, an avoidance reaction would have been produced, although the same system of nerve fibres might have been stimulated as by the fly.<sup>54</sup> So that if we picture the toad's response to the fly as due to a reflex arc we must postulate not one nerve tract connected with the tongue, but many thousands. Thus the simplicity of the reflex arc explanation disappears, and the toad's different behaviour with respect to the bee becomes, on the reflex arc hypothesis, entirely inexplicable.



It is clear then that even such apparently simple behaviour as that of the toad darting out his tongue when he sees a fly cannot correctly be described as a reflex response to a single stimulus. What determines the behaviour must be the pattern of stimulation and not the particular nervous tract which conveys the stimulation. This means that the field of true reflex responses is a very limited one and that the greater number of the actual behaviour systems that we observe cannot be explained by any system of inter-related reflexes.\* This does not mean necessarily that this kind of behaviour cannot be explicable in terms of physical and chemical laws. Such experiments have been used as an argument against mechanism but some psychologists have regarded them as capable of bearing a mechanistic explanation. It does mean that a simple and obvious mechanical theory (which we may call the "machine theory") breaks down.

#### 4. Instinctive Behaviour

We may take as an example of an instinctive reaction the behaviour of the larva of the Capricorn beetle (*Cerambyx*) described by Fabre.<sup>13</sup> This grub spends the larval and pupal period of its existence in the interior of an oak tree, feeding on the wood of the oak, and, incidentally, cutting a passage in the interior of the tree with its powerful jaws. It appears to possess neither sight nor hearing, and is picturesquely described by Fabre as "a fragment of intestine with a mouth." Yet when

\* That is, if we define a reflex action in the usual way as one dependent on conduction along a specific nervous tract. Thus Pavlov bases his definition on that of Descartes and says: "An external or internal stimulus falls on some one or other nervous receptor and gives rise to a nervous impulse; this nervous impulse is transmitted along nerve fibres to the central nervous system, and here, on account of existing nervous connections, it gives rise to a fresh impulse which passes along outgoing nerve fibres to the active organ where it excites a special activity of cellular structures."<sup>180</sup>

the time comes for it to become a pupa, before changing into the fully developed beetle, it carries out a complicated series of actions to secure the safety of the pupa, and the safe access of the developed beetle to the outside air.

It begins by opening a passage to the bark of the tree, leaving only a thin barrier of bark or none at all (for the mandibles of the beetles will not be powerful enough to overcome a thick obstacle). It then retires deeper into the wood (securing the pupa against danger from woodpeckers), and makes a chamber, rasping wood from the sides so as to line it with a kind of down (for the pupa is delicate). It builds a three-fold door, part of which is a layer of calcium carbonate, thick enough to resist the attacks of outside enemies but not thick enough to be an obstacle to the developed beetle. It then becomes a pupa with its head directed towards the entrance to the chamber, for the developed beetle, being too stiff to turn in the chamber, would be hopelessly imprisoned if the pupa were formed lying in the other direction.

We have here an example (one of many which could be taken from the same source) of a complicated course of action securing an end with a precision which we might at first sight be tempted to attribute to foresight and thought. Yet it is carried out by a creature which is clearly devoid of the mental equipment necessary for either, and under conditions where neither would be of any value (for the Capricorn grub has not seen a pupa or a developed beetle, and it has had no opportunity of being taught the operations by one of its own kind). It is a course of activities whose origin is an innate disposition in the grub. To such a disposition we give in comparative psychology the name of *instinct*.

Certain characters are common to all such instinctive courses of action. These are as follows:

- (1) Their adaptive character (without necessary foresight of the end to be attained).

(2) The smallness of the extent to which they can be modified to meet with novel factors in the situation.

(3) Their universality amongst members of the same species.

(4) The remarkable degree of perfection of their first performance (a process of learning may be almost or completely absent).

## **5. Adaptive Character of Instinctive Behaviour**

A striking feature of many instinctive courses of action is their great complexity. The procedure of the *Cerambyx* grub, if it were an intelligent series of actions, would show a high degree of foresight and anticipation of future dangers and difficulties threatening the pupa and beetle. Yet there is clearly no such conscious anticipation; the behaviour of the grub is the product of an inborn disposition which we may reasonably suppose to be as unconscious in its operation as is the growth of our own bodily organs. It is clear that it is necessary to give up the view (deeply implanted in popular thinking) that the precise adaptation of a course of action to an end is a mark of intelligence. Indeed, provided the end to be attained is the satisfactory dealing with a situation normally met with in the life of an individual of that species, such precise adaptation is the mark of instinctive rather than of intelligent action.

## **6. Relative Invariability of Instinctive Behaviour**

The second character of instinctive action—its relative invariability—is shown when the situation to be dealt with is different from that normally met with in the development of the individual concerned. The animal which can deal so wonderfully effectively with a normal situation may be helpless if the situation is altered even slightly from the normal.

If a bee-hive is moved a short distance, the returning bees are said to collect and die on the old position of the hive, instead of making the slight modification in their customary mode of returning to the hive necessary for them to enter the door in its new position. Fabre showed that when a line of the Pine Processionary caterpillars was broken and the two ends joined together so as to form a ring, they followed each other round the top of a flower pot for seven days without food before the ring broke up and they returned to the nest.<sup>78</sup> The solitary wasp was observed by the Peckhams always to build its nest, and then to seek and sting a caterpillar and drag it to the nest.<sup>185</sup> If it had stung its prey a long way from the nest, it would take hours dragging it to the nest and might be forced to abandon the victim altogether instead of adopting the easier alternative of building its nest near the caterpillar.

Different interpreters of animal behaviour have not agreed as to the amount of rigidity which must be attributed to instinctive behaviour. The question is of fundamental importance for the application of the conception of instinct to human life and behaviour. For, if instinct is essentially unadaptable to new circumstances, the conception of instinct will have little value in elucidating the problems of human behaviour, the predominant feature of which is plastic adaptation to new conditions. If, on the other hand, this plasticity is inherent in all instinctive behaviour, although embryonic amongst primitive organisms, we may regard human intelligence as no new thing replacing instinct, but simply as a development to a very high power of this primitive rudimentary plasticity. This plasticity may be supposed to have increased in the course of the evolution of the higher mammals because organisms were becoming adapted to environmental conditions so complex and varied that rigid and invariable responses would have been of no value.

The difference between the conception of invariable instincts put forward by Fabre<sup>72</sup> and immortalised by Bergson,<sup>23</sup> and that suggested by the researches of the Peckhams<sup>185</sup> has become classical. Both Fabre and the Peckhams studied solitary wasps of the genus *Ammophila*, which sting caterpillars and carry the paralysed prey to their nests, laying eggs upon it, so that it may serve as food to the grubs when they are hatched. Fabre observed *A. hirsuta* of Europe while the Peckhams studied *A. umaria* of North America. Fabre believed that these insects showed absolute accuracy in their behaviour in respect to their prey (stinging the caterpillar precisely through its ganglia so that it was neither capable of movement nor dead when the grubs were ready to eat it), and complete absence of individual variation.

The later researches of the Peckhams, on the other hand, show flexibility and imperfections in the habits of the solitary wasps they studied. The conclusions of this research may be best told in their own words:

"The all-important lesson," they write, "that Fabre draws from his study of the *Ammophiles*, is that they are inspired by automatically perfect instincts which can never have varied to any appreciable extent from the beginning of time. He argues that deviation from the general rule would mean extinction. The conclusions that we draw from the study of this genus differ in the most striking manner from those of Fabre. The one pre-eminent, unmistakeable and ever present fact is variability. Variability in every particular—in the shape of the nest and the manner of digging it, in the condition of the nest (whether closed or open) when left temporarily, in the method of stinging the prey, in the degree of malaxation, in the manner of carrying the victim, in the way of closing the nest, and last, and most important of all, in the condition produced in the victims of the stinging. . . ." Some of these, they noted, die and decay, while others are kicking actively when the grubs are ready to eat them, but the grubs seem to get on as well in both conditions as if the caterpillar were alive and merely paralysed.<sup>185</sup>

## 7. Universality amongst Members of the same Species

This universality, and the almost complete absence of a process of learning in the acquirement of an instinctive reaction, are the two main grounds on which is based the

view that instincts are innate or inherited reaction patterns, and are not acquired during the life-time of the individual possessing them. It is clear that uniform behaviour of different individuals of the same species is evidence of its innate origin only if, when other possible causes of uniformity are eliminated, the uniformity still appears. Learning and imitation might produce amongst animals and men uniformities which at first sight seemed to be due to a hereditary tendency.

Attempts were at one time made to explain instincts on these lines, but both observation and experiment show that learning and imitation are not adequate to account for all the uniformities of animal reactions. The behaviour of the *Cerambyx* grub, which we have already taken as a typical example of instinctive behaviour, cannot, for example, be accounted for in this way. Examples might be multiplied of animals similarly carrying out adaptive courses of action with no previous experience of the conditions for which they are adapted, and no opportunity of learning from others of their own kind.

The same question has been attacked by the method of experiment. The instinctive reactions characteristic of its species are found to develop in an animal even if it has been separated from its kind from the time of its birth, so that learning and imitation have been impossible. There may, however, be variations in the details of its performance showing that these details are not innate but are imitated or learned from its parents.

Instructive in this connection are the experiments of Scott on the development of song in Baltimore orioles<sup>210</sup> and of Breed on the development of pecking in chicks.<sup>32</sup> Scott isolated young Baltimore orioles before they had heard any of their own kind sing. Their early incomplete attempts at song were like those of the wild bird. Finally they became good and voluble singers. Their adult song, however, was unlike that of the wild orioles except for the occasional use of the rattle. He obtained similar results

in experiments on other birds. Thus, while both the tendency to sing and the details of the song are found to be almost invariable amongst birds of the same species, these experiments show that the first only of these characters is innate while the other owes its uniformity to social influence.

In contrast with these results, the pecking reaction in chicks seems to show practically no dependence on learning. Breed made curves showing the rate of improvement in accuracy of the pecking reaction in two chicks, one of which was isolated while the other was able to watch old birds pecking.<sup>32</sup> No significant difference was found between the two curves.

Owing to the development in the human race of language and complex social organisations, it is particularly dangerous to infer that uniform modes of behaviour are truly innate. Even where such uniformities are widespread, the possibility of their spreading by transmissions of culture must be carefully considered before it is supposed certain that they are direct expressions of instincts. Probably most widespread uniformities of human behaviour are due to the interaction of these two factors. There is, undoubtedly, handing on of modes of behaviour by such influences as the direct teaching of one generation by another, the persistence of social institutions, and culture transmission from one land to another. There are also, however, innate resemblances in the instinctive equipment of the men of succeeding generations and of different countries which make the practices transmitted acceptable to men of a new generation or race.

## 8. Relative Perfection of First Performance

This also is a character in which a primitive instinctive reaction differs from the kinds of behaviour most characteristic of human life. The man who has learned to swim by prolonged and laborious effort feels a pang of envy when he sees the duckling swimming without difficulty on its first entry into the water. The complicated behaviour of the *Cerambyx* grub is carried out without any previous experience to guide it.

Yet here again, we must avoid falsification of our comparative psychology by exaggeration of a striking characteristic. The instinctive reaction is not always perfect on its first appearance; many cases have been observed in which an improvement in the reaction takes place in later performances. The general rule appears to be that an instinctive reaction on its first appearance is sufficiently perfect to be serviceable. It is clear that this degree of perfection is biologically necessary. The young bird on first leaving its nest does not fly so well as it will in a few days, but it flies well enough to save itself from falling to the ground. If it did not, every young bird hatched in a nest high up from the ground would be killed on its first flight and its flying instinct would have no survival value.

It remains to be decided whether the improvement in an instinctive reaction is due to improvement by practice or to the progressive maturing of the mechanism of muscle and nerve by which the action is carried out.

A further series of observations by Breed<sup>33</sup> on the pecking reaction in chicks gives an answer to this question. He observed the number of pecking reactions carried to a correct conclusion (ending in the swallowing of the morsel), out of fifty attempts. He compared on successive days the average results in a group of chicks which had been allowed to start pecking on the second day after leaving the shell, with others which had been delayed to the fourth, fifth, and sixth days. It was found that the initial accuracy was low in all cases (from 8 per cent. to 18 per cent. correct reactions), and there was no significant difference between the initial accuracy of the chicks which began to peck on the second day and those which were delayed until later. The rate of improvement was in all cases rapid at first, but the improvement was noticeably more rapid in those chicks which had been delayed. The chicks delayed to the fourth day, for example, were as accurate on the sixth day as those which had already been pecking for



four days. Those which began to peck on the sixth day were, on the following day, pecking as accurately as those which had not been delayed.

The conclusion one draws from these experiments is that the imperfection of the initial performance of the pecking reaction is independent of the degree of maturation of the bodily mechanism used, and that the subsequent improvement is therefore due to practice. The increased rate of this improvement in the birds which acquired the reaction later was, however, due to the more mature condition of the mechanisms used.

### 9. The Biological Classification of the Instincts

Instincts have been classified in various ways. Some writers have classed as separate instincts the systems of movements co-ordinated together to form complex muscular activities, such as walking, swimming, nest-building, etc. Since, in fact, these activities, although they have an instinctive energy behind them, are themselves made up of movement systems which are only partly innate and in a large measure may be acquired, it seems better to call them separate motor mechanisms and to reserve the word "instinct" for the energy behind them which seems to seek a goal and to use a variety of motor mechanisms for its attainment. Thus a rat may be running to food or to a mate. The motor mechanism is in both cases the act of running, but two different instincts may be said to be in operation in the two activities since the energy behind them is directed towards different goals.

The instinctive driving forces behind animal behaviour have been classified according to their evolutionary function in three great groups:—

- (1) The system of instincts of self-preservation.
- (2) The reproductive system of instincts.
- (3) The gregarious or social system of instincts.

The system of *instincts of self-preservation* comprises those innate tendencies which have as their biological function the survival of the individual possessing them. These are, for example, the tendency to seek for food, the tendency to escape from danger, and so on. It is clear that in the struggle for existence any animal lacking these tendencies would soon be eliminated, through death from starvation or by falling a prey to some other animal.

The *reproductive instincts*, on the other hand, have no value for the survival of the individual. These are the tendencies to find a mate, to construct a nest or other place for the rearing of the young, and to care for these young when they are born. From the point of view of individual survival, these tendencies have not only no survival value but may actually favour the elimination of the individual possessing them. The individual animal possessing no innate tendency to sacrifice its own safety and well-being for its mate or offspring would stand a better chance of living to old age. They are, however, clearly necessary for the continuance of the race. The individual deficient in these reproductive instincts would leave no offspring, and so by the operation of the ordinary laws of natural selection they are generally to be found in every individual.

The third group of instincts is one which at one time was supposed to present insuperable difficulties to the theory of natural selection. It includes not only the tendency for certain animals to live in large social groups but also their tendency to co-operate in activities in which the group acts as a unit (as in co-operative hunting) and also the mutual aid behaviour to be found amongst animals of the same species (such as care for sick and wounded). The extent of such co-operation and mutual aid behaviour amongst animals has been the subject of much controversy. Kropotkin considered that Darwin and his followers had over-emphasised the universality of competition between

animals and he collected much evidence of co-operative behaviour.<sup>279</sup> Although some of his evidence was anecdotal and it was highly selected to emphasise only one side of animal life, it is now generally agreed that such mutual aid and co-operation does occur although competition and mutual destruction is also found amongst members of the same species (destruction of wounded animals by their fellows seems commoner than their help).

T. H. Huxley explained the possibility of co-operative behaviour on the theory of natural selection by pointing out that it might happen in the course of evolution that the social group rather than the individual was the unit on which the laws of survival worked. Let us suppose, for example, that carnivorous animals are living in a region so depleted of the animals on which they prey that a single individual is unable to get continuously sufficient food to survive. It is then possible that a herd of such animals (being a more effective hunting weapon than the same number of individuals hunting separately) might still be able to maintain itself under these more severe conditions.

It is clear that those herds, the members of which had most strongly developed as individuals the qualities which made the herd an effective hunting body, would stand a better chance of survival than the herds composed of members that lacked such qualities. The qualities necessary would be all those which drove the individual to act with the herd in an effective manner, and with the minimum of interference from his self-preservative impulses when these tended towards action inimical to the good of the herd. Herds whose individuals had these qualities most strongly developed would survive while herds with less perfectly socialised individual members would tend to be eliminated (thus, individuals possessing the social behaviour tendencies would have on the whole a better chance of surviving than those deficient in them).

This classification is a practically convenient one and may be used as the basis for a broad classification of human behaviour systems whether or not we call these systems of instincts. We can describe the behaviour of migratory birds which show alternation between gregarious behaviour in the winter and mating behaviour in the summer as showing alternation between behaviour belonging to the gregarious and to the reproductive systems. The human conflict between the demands of the sex instinct and the prohibitions of sexual behaviour imposed by social convention (the conflict which, according to Freud's theories, is at the root of psycho-neurosis) may similarly be represented as a conflict between the forces of the reproductive and the social behaviour systems.

Such representation may be practically convenient. We cannot be sure, however, that the divisions between these systems correspond to essentially different innate driving forces. A bird collecting grubs may swallow a particular grub himself or take it to the young in the nest. It is difficult to suppose that essentially different driving forces were behind the bird's conduct in the two cases. Behaviour for self-preservation and for the preservation of the young are inextricably entwined together. Still more difficult is it to make a sharp distinction between reproductive and social behaviour. The ant nest which is often taken as the supreme example of the operation of social instincts is, in fact, a large family. The behaviour of the ants in relation to the queen and the brood might equally well be regarded as behaviour arising within the reproductive system of instincts. Nor is this difficulty absent in the consideration of the behaviour of mammals. Zuckerman attributes part of the grouping of baboons to the sexual attraction of unattached males by the females belonging to the dominant male's harem.<sup>284</sup> Co-operative and mutual aid behaviour, moreover, occur most conspicuously in the family group. It is possible that human social life started in the family and that what appear as

social behaviour tendencies are simply the extension to a larger social group of behaviour responses which innately belong to the family situation. If this were the case, Freud would be right in thinking that the social behaviour system is not an independent one but is derived from the reproductive system.<sup>82</sup>

## CHAPTER III

### ACQUIRED PATTERNS OF BEHAVIOUR.—I.

#### 1. Instinct and Intelligence

In the example of instinctive behaviour which we considered in the last chapter, the *Cerambyx* grub was behaving in a way which was both automatic and innately determined. These two characters, however, are not invariably coupled together. A behaviour tendency may be innate or acquired; also it may be either automatic or variable. These are cross divisions of behaviour possibilities and behaviour may fall into any of the four possible classes: automatic-innate, automatic-acquired, variable-innate, or variable-acquired. The tendency to sexual behaviour is, for example, innate; the behaviour itself may either be very automatic as in the rat, or very variable as in man and to a lesser degree in the higher apes.<sup>284</sup> On the other hand, a dog's habit of barking when the postman rings the front door bell may be as automatic as its instinctive response of turning round before it lies down; while the behaviour of a man, when someone rings his front door bell, is highly variable and dependent on who is the person ringing and whether the man wishes to be disturbed.

The distinction between innate and acquired behaviour is the distinction between *instinct* and *habit*; the distinction between *non-intelligent* and *intelligent* behaviour is that between automatic and variable behaviour—i.e. between behaviour that is automatically adaptive to the requirements of a more or less stereotyped situation and behaviour that is adaptive by variation to the requirements of the particular situation. Thus we see that intelligence is not to be contrasted with instinct. Instinctive behaviour may be more or less intelligent, as also may habitual behaviour.

While intelligence is not in direct contrast with instinct, there is certainly a tendency for the characters in the above two pairs of opposites to be correlated. The higher vertebrates as compared with the insects are obviously more intelligent and less richly endowed with instincts. This is perhaps the reason for the common opinion that instinct and intelligence are opposite characters. The correlation is, however, by no means complete. There is, for example, no evidence that the more intelligent of the higher vertebrates (such as the apes and the solitary carnivores) are relatively poorer in instinct. If, moreover, we compare with the insects, animals lower in the scale of nervous organisation (such as the sea-anemones) we find these relatively lacking both in instinct and in intelligence.

We should notice too that each of our contrasting pairs are opposite poles of behaviour possibilities with an indefinite number of intermediate steps between them. There is no sharp line dividing innate from acquired behaviour or dividing automatic from intelligent behaviour. Any particular piece of behaviour may be anywhere along the line between these polar opposites. Behaviour with an innate basis may nevertheless be more or less influenced by habit formations acquired during the course of the individual's life. This is obviously true, for example in what are often called human instincts. The tendency to run away when fear is experienced is at bottom innate but the actual behaviour of the man in flight will show the operation of a vast number of acquired habit systems, of walking, running, cashing cheques, taking railway tickets, and so on. Similarly behaviour may show a lesser or greater degree of variability. If the degree is small, the behaviour is little removed from purely automatic behaviour; if large, it becomes highly intelligent.

In the present chapter, we shall be concerned with the second of these distinctions, that between automatic and plastic behaviour. If we make a comparative study of animals at different levels of the evolutionary scale, we

find all intermediate steps between those whose behaviour is predominantly automatic (innately determined, invariable, and adequately adapted to the situations in which the creature finds itself but incapable of variation to meet the needs of new situations) and those capable of showing also intelligent behaviour which is a product of no enduring disposition but capable of variation to meet the complexities of new and unusual situations.

Such different levels of plasticity of behaviour show an obvious correlation with the character of the nervous system. Lowest in the scale of behaviour amongst animals with any nervous system at all are those like the jellyfish with a nerve net transmitting impulses in all directions with no centralised control. These animals seem to have no nervous mechanism for varying behaviour and show as nearly complete automatism as we find in animal behaviour, although not altogether complete. It seems that even unicellular organisms like *Amoeba* with no nervous system are not entirely lacking in plasticity of response.<sup>120</sup>

The possibility of variability of response is increased with increased complexity of the nervous system. Animals low in the evolutionary scale with primitive and uncentralised nervous systems (such as the *Coelenterata*) have little plasticity of response. The possibility of adaptive variability of response becomes greater when nervous control begins to be centralised by the domination of part of the nervous system which becomes the principal centre for distribution and co-ordination of nervous impulses. Such a dominant ganglion in the head is found amongst the insects. Thus ants, whose behaviour is largely automatic, are reported to show a small but not insignificant degree of plasticity of response (Forel says that they are 9/10ths automatic and 1/10th intelligent). In the vertebrates, the amount of centralisation of distributive functions in the central nervous system is greater and plasticity also becomes greater.



Increased variability of response is not the only result of centralisation in the nervous system. This centralisation also results in increased power of *co-ordination*, the capacity of different parts of the organism to act in conjunction as mutually interdependent parts of a single whole. Thus a man, bitten on the leg by a mosquito, may respond not by a movement of the leg but by crushing the insect with his right hand the movements of which are directed by his eyes. The sense organs of the leg, the muscles of the arm and hand, and the visual apparatus are all acting as parts of an integrated system. This co-ordination (or integration of response) is not necessarily bound up with plasticity of response although both depend on nervous centralisation. Amongst the vertebrates, the spinal cord and the lower and mid-brain remain centres of reflex responses, highly co-ordinated but nevertheless automatic.

The development of plasticity is correlated with development of the upper brain or cerebrum. Thus, low in the vertebrate scale, we have such animals as the snake which may show even the complexly co-ordinated response of striking accurately at a hand touching it after its head has been cut off, thus showing that its poorly developed cerebrum plays no essential part in this automatic reaction.<sup>108</sup> Higher up in the vertebrate scale we find the cerebrum increasing in size and importance as compared with the rest of the central nervous system, a process culminating in ourselves. We find, too, greater plasticity of response amongst such higher vertebrates, and also the greatest amongst ourselves.

Pure plasticity of response, in which all items of response are new and unpredictable, we find, of course, nowhere. Plasticity of the innate behaviour tendencies forms the foundation for the development of a large number of secondary automatisms or habits. Original plasticity of response is the condition for the development of a large number of habit systems appropriate to different environments and for the possibility of intelligent choice between

the responses belonging to these habits so that behaviour may be appropriate to any new or unusual situation.

Intelligence is the name that we give to this capacity for varying behaviour to meet the requirements of a changing environment. If we admit that intelligence can exist in all degrees from zero upwards, we need not dispute about the exact point at which animal behaviour is to be called "intelligent." We have seen that the beginnings of plasticity of behaviour are to be found low down in the animal scale. In the most rudimentary deviations from the rigidity of automatic behaviour, we see the germ of intelligence.

## **2. Spontaneous Variability of Instinctive Behaviour**

The simplest organisms live under remarkably uniform conditions, so that, on the whole, uniform responses to situations are those which best serve for their survival. This would appear to be the biological ground for the comparative rigidity of their instincts. But even the simplest organisms are liable to meet with unusual situations, and the rigidity which serves them so well in a humdrum natural existence will be unserviceable or even dangerous as a mode of dealing with a novel element in the environment. Successful dealing with such unusual environmental demands can only follow from a modification of the ordinarily rigid instinctive behaviour. What, in fact, does happen to animals' instincts when they are faced by such problems? This is a vital question for the beginning of our study of intelligence.

The answer to this question can be obtained by observation and experiment. We find that what happens under such conditions depends both on the organism observed and on the extent of the disturbance made in its customary conditions. Sometimes the result of modifying the conditions under which an animal carries out an instinctive course of behaviour is failure of the animal to modify its

conduct, with the result that its instinct ceases to be serviceable under the new conditions. Sometimes, however, the animal responds by a new course of behaviour, adapted to the new conditions, which is apparently as innate and as little dependent on a thought-out appreciation of the position as is its more usual behaviour.

We may first find an example of a failure to adapt conduct to a new situation in Fabre's much quoted observation of the result of interfering with the routine of a *Sphex*.<sup>72</sup> This wasp, before dragging her prey into the nest prepared for it, would always leave it just outside the nest while she went inside, returning an instant later and pulling the paralysed caterpillar in. When Fabre pulled the caterpillar some distance away from the hole, the wasp repeated this ritual, again leaving the caterpillar just outside, and again finding it pulled away when she came out. Most of the *Sphex* were willing to repeat this an indefinite number of times, never making the simple modification of behaviour necessary to pull the caterpillar straight into the hole.

But this great exponent of rigidity in instinctive behaviour noticed that even insects did not always fail to make useful modifications of conduct in face of new conditions. He found for example that a certain *Sphex* refused to be duped by the drawing of her prey from the mouth of the hole when she was inside, but dealt with the situation very effectively by pulling the caterpillar directly into the nest instead of repeating the ritual of a preliminary descent alone. The few insects which show such adaptability are, he says "the revolutionaries," and he regarded them as exceptions.

But even the researches of Fabre himself lead us to the conclusion that adaptability is not so rare amongst insects that it can be ignored in giving an account of their instincts. He took two dozen nests of the bee *Osmia* from a quarry where they had been nesting for centuries in shells, and placed them in his study with some hollow stalks and

hollow shells. When the bees came out in the spring nearly all selected the stalks to nest in as the better suited to their purpose. Indeed such variability of response to different situations must often be regarded as an innate part of the system of the instinct. Fabre observed, for example, that the blue-bottle fly laying its eggs on a dead linnet would choose its mouth as the best spot for depositing them.<sup>73</sup> If the mouth, however, was closed tightly, she would lay in the eye; if the head was enclosed in a paper bag, she laid in the bird's wounds; if the head was enclosed and the bird unwounded but plucked, she laid a few eggs only in the cavity of the axilla and the crease where the thigh joins the belly. Only if the head was covered and the bird unwounded and unplucked was she completely frustrated and no eggs were laid.

As we ascend the animal scale the modifiability of instinctive behaviour becomes greater. Two instances described by Pike may be taken of spontaneous modification of instinctive behaviour in birds.<sup>100</sup> The moor-hen usually builds its nest of grass and reed stems, but this observer noted that on a piece of water where these were absent, the birds constructed their home of wood, with just a small lining of grass. Some linnets also, deprived of their usual nesting places, showed a simple and effective adaptation to their new conditions. These had nested for years in small canopies of fir branches which were placed on the ground to attract wild ducks. When these were done away with, they continued to nest on their old haunts, and since there were no small bushes there (such as the birds generally nest in) they took to the grass and built their nests a few inches above the ground.

The common feature of all the above examples is that they are instances of an instinctive response whose usual form is frustrated by some unusual element in the situation. Instead of showing a mechanical rigidity, and consequent failure to deal with the novel situation, the instinct shows itself capable of expression in an unusual mode of

behaviour better adapted to the particular situation of the organism. Sometimes, indeed, a modification in instinctive behaviour is found when there is no novel element in the environment to call it out. Such is the familiar observation of the Peckhams of one specimen of *A. urnaria* which modified the behaviour of her species so far as to smooth the earth about her completed nest with a small pebble she had picked up as an instrument better adapted for this purpose than her feet.<sup>185</sup>

Such instances of instinct modification as these may be called *spontaneous instinct modifications*, in order to distinguish them from those modifications of behaviour which take place as a result of learning or intelligent insight. There seems no reason for supposing that such modifications of behaviour as we have been describing need for their explanation either thought or the utilisation of past experience. They are manifestations of that plasticity of instinctive behaviour which is an element in it no less innate and original than is its approximately rigid pattern.

When the conditions of an organism are invariable, rigid pattern reactions are all that it needs for effective dealing with its environment. As its environment becomes more liable to change, its innate pattern reactions must become more plastic. Finally we come to such environmental conditions as those of civilised human life, in which variations in demand on behaviour are so constant and complex that mechanical innate behaviour patterns would have no survival value, and plasticity of behaviour resulting in complex, discriminative, and graded responses becomes almost an invariable rule. The instincts survive only as a framework on which such variable and complex behaviour is built.

We will close this section by a description of an experiment by Fabre on the modifiability of behaviour of the burying beetle when the ordinary instinctive response of burying a carcass on the spot where it is found has been

thwarted by placing it on a piece of ground in which the insect finds itself unable to dig.<sup>73</sup>

Fabre placed the body of a mouse on a brick lightly covered with sand but with deep earth all round, so that the mouse could not be buried on the spot where it was lying but could be buried anywhere near it, and he observed the behaviour of several burying beetles. His object was to discover whether the beetles would remove the carcase to a more suitable place when they discovered the unsuitability of its situation. Other observers had given accounts of the burying beetle's behaviour under similar circumstances which suggested such plasticity in the insect's conduct as would make it necessary to attribute to it intelligence of a high order. He found that a very long time (no less than two hours) was wasted in attempts to bury the mouse on the spot with much ineffectual, mutually opposed heaving of the body. Then some of the beetles left the body and made borings in different parts of the surrounding earth. Although all were in the deep earth, five of these trial borings were abandoned and the sixth was apparently selected. The beetles returned to the body of the mouse and it was heaved to the site of the sixth boring, and was there buried in the ordinary way six hours after the beginning of the experiment and four after the recognition of the impossibility of the first spot.

We must recognise two things in the course of conduct described by Fabre: adaptability of behaviour to the new situation, and a peculiar clumsiness in the adaptation. Faced with the same situation a party of men could not have done more than to shift the object to be buried to a better situation and to bury it there. They would not, however, have taken so long to make the change. Certainly they would not have spent two hours trying to dig through the brick. The whole process would have been shortened by a much more rapid learning from experience and by some of the overt actions of the beetles being

replaced by thought processes. It is unnecessary to ask whether the beetles' actions were intelligent. Adaptability of instinctive response is intelligence. But such adaptability as the burying beetle shows is intelligence of a very low grade.

In this experiment, however, we have adaptation of a higher grade than in the cases we have previously been discussing, for the new conduct of the burying beetle is not merely a new response called out from its innate repertoire by a new situation. Instead, a line of action is abandoned because it fails to attain its end. In place of random attempts to bury the mouse, trials are made of suitable spots to bury it, and the body is transported to the new situation. There is, in fact, a suggestion of learning by experience. This is the next highest grade of plasticity of instinct.

### **3. Modification of Instincts by Learning**

One of the most striking characteristics of the living organism is the extent to which its past actions and experiences modify its future behaviour. If a billiard ball is hit skilfully so that it makes a cannon and leaves the other balls well placed, it will have suffered no modification of its structure that will make it in any way more likely that, from the same starting point, it will follow the same path again. But such modifications are continually met with in animal behaviour. The dog that has once caught a rat in a stable will look for rats when he returns there, or if he has been hurt by the kick of a horse he will be unwilling to bark near the hind legs of horses in the future. The animal's instinctive behaviour undergoes continual modification through its experiences; positive or seeking reactions tend to be developed in situations that have given satisfaction and negative or avoiding reactions in situations or towards objects that have given annoyance.

The fundamental laws of learning usually distinguished by investigators of animal behaviour are the *law of exercise*, the *law of effect*, and the *law of conditioned reflex formation*. These will be dealt with in turn.

#### 4. The Law of Exercise

This law states that the carrying out of an action or of a system of actions facilitates its subsequent performance. The negative aspect of this law (sometimes called the *law of disuse*) is that failure to carry out an action or system of actions over a sufficient length of time reduces their tendency to reappearance. There are two subsidiary laws: the *law of frequency* which states that such exercise is more effective the more frequently it is carried out, and the *law of recency* which states that (other things being equal) exercise is more effective the greater its recency.

The effects of exercise on learning are cumulative, a greater number of repetitions increasing progressively the facilitation of the response. Finally, such actions as shaving or performing the motions for opening a door have been performed so often that they take place with the minimum of conscious control. Such more or less automatic acquired behaviour patterns are called habits. Such instincts as human beings have are simply foundations on which are built a large number of habit systems. There seems no sufficient ground for the assertion that the instincts are the only movers to action or that emotional experience is connected only with instinctive activities. The performance of a habitual action itself gives satisfaction, and annoyance is caused by interference with it. Particularly after people have reached an age at which they do not readily form new habits, any interference with their habitual mode of behaviour is resented by them and is felt as acutely unpleasurable.

A point of some practical importance in connection with the law of frequency is that there is no reason for supposing



that there is any frequency after which further repetitions cease to have further effects on learning, although this is sometimes implied in ordinary speech. When the object of learning is a verbal habit (in human learning by heart) we generally say that something is "learned" when it can be repeated without error. Experiment shows, however, that repetitions beyond this point increase facilitation of the response and such further repetitions are called "overlearning." An overlearned activity is more automatic and more permanently retained than one that has been just learned. The ordinary arithmetical additive operations, for example, are during our school days very heavily overlearned and for their subsequent usefulness it is very necessary that they should be.

We must notice that what is to be explained in learning is not the facilitation of some single movement, but the organisation of a group of movements together. A set of movements previously performed in other groupings becomes integrated as a unitary behaviour system. Once such a unitary system has been formed, it tends to appear as a whole when the appropriate situation for its appearance arises. Independent control of the separate elements of the system is very largely lost when it is thus integrated. Thus a skilled activity such as serving at lawn-tennis or any habitual activity such as walking or sitting down, if it has originally been learned with superfluous or undesirable elements, cannot without great difficulty be freed from these. \*

It is of considerable practical importance to notice the conditions under which the law of exercise is effective. Thorndike pointed out that animals did not learn by being put through a task by someone holding and moving their limbs.<sup>238</sup> Reasons have since been put forward for doubting whether Thorndike's total denial of any effectiveness of movement in which the animal is passive is not too absolute, but it is at any rate certain that self-originated activity is so much more effective in learning than any other

method must be regarded as very inefficient. In human learning by heart, a very large number of purely passive repetitions will be less effective than a much smaller number in which, after each, there is an active attempt to recall what has just been read. This was Ebbinghaus's learning method in his famous experiments on nonsense syllables. Also it is found in human learning that the intention of learning is essential to the effective action of the law of exercise. An enormous number of passive repetitions without the intention of learning (such, for example, as are provided in an experiment on distraction) may result in no appreciable learning. In animal experiments, the intention to learn is provided by the incentive given to the animal. This may be hunger or the tendency to avoid an electric shock or to escape from confinement.

### 5. The Law of Effect

This is the name which has been given to the tendency of lines of conduct which are successful in attaining their end to be repeated, while there is a similar tendency for unsuccessful lines of conduct to be inhibited. A particular kind of learning based on this principle has been called *learning by trial and error*.\*

An example of learning of this kind is to be found in Lloyd Morgan's observations on young chicks. These began by picking at all small objects, but in two days a young chick had learned to pick out pieces of yolk from pieces of white of egg. When the observer mixed pieces of

\* The term *trial and error behaviour* may be used of any system of movements of which some are successful and others unsuccessful. Thus Jennings speaks of trial and error behaviour in Protozoa when these make a direction-changing turn which is discontinued when they find themselves going away from the disturbing stimulus (see p. 22). In this case, however, there is no learning since there is no lasting modification of the behaviour tendencies as a result of the trial and error. Only when unsuccessful movements tend to be eliminated and successful ones to be repeated can we speak of *trial and error learning*.

orange peel with the egg these were at first picked up, but their unpleasant taste made the chicks quickly reject them, and they were not afterwards seized. Thus the behaviour of seizing and swallowing fragments good for eating was implanted, while similar seizing and swallowing of unpleasant fragments was inhibited.<sup>169</sup>

It has been stated that modification of conduct by the method of trial and error begins very low in the animal scale. Day and Bentley enclosed specimens of the infusorian *Paramecium* in a glass tube of which the diameter was smaller than the creature's length.<sup>60</sup> This made it difficult for them to make their usual avoiding reaction,\* and necessitated their doubling on themselves in order to reverse their course. It was found that within a very few minutes they had made the necessary modification by prolonging the lateral turn. Then, when the same *Paramecia* were again placed in the capillary tubes, they showed an improvement on their former learning of the necessary modification of the avoiding reaction, both by accomplishing the first turns more quickly and by reaching the maximum speed and facility of turning in a much shorter time. This result sounds as if the infusoria had modified their behaviour by their earlier experience, but this conclusion has been criticised on the ground that changes may have been produced in the shape of the animals' bodies, and that the improvement may have been due to the persistence of this change.<sup>210</sup>

The classical example of trial and error learning is Thorndike's set of experiments with cats enclosed in puzzle boxes from which they had to release themselves by clawing at a string or lever in order to get food.<sup>238</sup> He maintained that the animals made at first many useless and apparently random movements, one of which in the end would by chance be the action required for release. In future confinements, the law of effect made it slightly more probable that this successful action would be

\* See p. 22.

repeated, so it tended to come earlier in the system of random movements. Finally, all other movements were eliminated and the releasing movement appeared alone, but the gradualness of the improvement suggested that there had simply been a progressive mechanical elimination of unsuccessful movements and no sudden seeing into the situation such as a human being might show in similar circumstances.

The rule of such learning appears to be: *if the carrying out of an action is successful (in attaining the end aimed at) the subsequent repetition of that action is facilitated; if unsuccessful, its repetition tends to be inhibited.* Since amongst human beings (and presumably amongst the animals) pleasure accompanies the successful performance of an act, and unpleasure results from failure, the above law is sometimes expressed in a form which states that it is the pleasure of success and the unpleasure resulting from failure which facilitate and inhibit courses of action respectively. This seems to be an example of unjustifiable speculation about the state of mind of an animal. It is better to state the law only in terms of what can be observed and to leave open the question of whether the facilitation and inhibition is a result of pleasure and unpleasure, or whether it is an effect of the mere success and failure apart from any feeling about them.

Trial and error learning, as described by Thorndike, is entirely mechanical. The successful action originally appears accidentally as one of a repertory of possible movements and has not been produced because of its appropriateness to the situation. Its subsequent facilitation is also mechanical and is the inevitable result of a tendency for success to make the action leading to it more likely to reappear. It is not the result of the fact that the animal has understood the connection between the action and the release. We must ask how widespread is such blind learning.

Thorndike himself regarded his results as valid only for animals at or below the evolutionary level of the cats he experimented with, and produced evidence that monkeys learned by another method. This was shown by the fact that their learning curves showed a sudden drop to complete solution, such as would be shown when a human subject saw through the problem, instead of the slow decline of the learning curve of the cats.

Thorndike's followers have not, however, always been so cautious, and the law of effect has been regarded as a fundamental law of learning which can be extended to human learning if we postulate only that man carries out trial and error in thought processes and not merely in explicit behaviour. Before we speculate so widely, it is necessary to be sure that this is a general law of learning and not merely a method of learning dictated by a particular experimental situation.

Köhler pointed out that learning of the type described by Thorndike was imposed by his experimental set-up.<sup>133</sup> The essential connections of the mechanism (*e.g.*, between string and latch) were generally concealed from the cat so that the animal had no opportunity of seeing into the nature of the mechanism even if it were capable of doing so. It has been shown that, under similar conditions, human beings learn to perform a task in a similar way.<sup>131</sup>

In his own much simpler experiments with chimpanzees, Köhler found that the animals did not learn by trial and error but by attaining insight into the nature of the solution of the problem although this power of insight was severely limited by the complexity of the problem. For example, bananas were hung from the roof out of an ape's reach and a box was left on the floor which would enable the animal to reach the bananas if he moved it under them and climbed on to it. The chimpanzee might do nothing about the box or he might smash it up in rage but he never moved it at random until by accident the bananas were within reach. When he moved it, he pulled it straight

## CHAPTER IV

### ACQUIRED PATTERNS OF BEHAVIOUR.—II.

#### 1. The Conditioned Reflex

The classical experiment on the conditioned reflex was performed by Pavlov, using a dog as his subject. If food is presented to a dog, its salivary glands begin to secrete.<sup>181</sup> This is known as an *unconditioned reflex*. If now a bell is rung several times at the same time as food is presented to it, it is found at the end that the secretion of saliva will take place when the bell is rung without the presentation of food at all. The mere ringing of the bell is now sufficient stimulus to cause the secretion of saliva. This is called a *conditioned reflex*. Salivary secretion has become conditioned to the new stimulus of the bell.

The essential principle underlying the formation of conditioned reflexes is one that will be familiar to anyone with even a slight acquaintance with the history of psychology. It is the principle of *association by contiguity in time* which was one of the fundamental laws of association of ideas.\* The formula for association by contiguity in time was that if the ideas of the objects *A* and *B* had frequently occurred to a person's mind simultaneously or successively (through his seeing the objects simultaneously or successively) then the idea of *A* would in the future call up the idea of *B*. If in this formula we substitute for *idea of A* the words *the stimulus A* and for *idea of B* the words *reflex response to B* we get the formula for the conditioned reflex. If, therefore, we follow the more extreme behaviourists in making the conditioned reflex the explanation of all acquired modes of behaviour, we have

\* See p. 276.

a picture of human conduct which is extraordinarily like that given by the associationists. It is unfortunate that this relationship should have been obscured by the general adoption of the term "conditioned reflex" instead of the term "association-reflex" which was proposed and used by Bechterev.<sup>20</sup>

It would, however, be unjust to Pavlov's work to suggest that it is merely a rediscovery of the principles of the associationist psychology. There is certainly no novelty in the general principle and still less in its speculative application as the single explanatory principle of all acquired behaviour, animal and human. That simply gives an associationist psychology in a new terminology, open to all the objections to the old associationism, with the additional objection to the unwarrantable extension of the conception of "reflex" to kinds of behaviour which are certainly not in any sense reflex.

Pavlov's discovery of the conditioned reflex was essentially the rediscovery of association by contiguity but it was also a good deal more. In the first place, it was a great gain that the principle was clearly stated to hold between elements of behaviour and not merely between ideas. Many of the things found out about conditioned reflexes, moreover, were entirely new—facts about the inhibition of conditioned reflexes, their dependence on the cerebral cortex, and so on. Many of these discoveries suggest interesting analogies with higher processes.

Against treating the conditioned reflex as a very general principle of behaviour modification, however, it is necessary to remember not only the very limited range of behaviour to which the conception of reflex is applicable but also the very limited conditions under which Pavlov's experiments are successful. The dogs are experimented on in a room by themselves to which they are thoroughly accustomed. The two experimental stimuli are the only variable stimuli present; the presence of any strange stimulus would disturb the formation of the reflex.

Furthermore, the conditioned and unconditioned stimuli must be presented together many times before the conditioned reflex is formed, and the conditioned reflex is subsequently found to be inhibited by a few repetitions of the conditioned stimulus (the sound) without the unconditioned stimulus (the food).

## **2. Inheritability of Acquired Behaviour**

In the early days of psychological speculation, there seemed no special difficulty in supposing that instincts were modes of behaviour which had been adopted by successive generations of animals and had therefore been inherited by their descendants. The evolutionary development of instinct has been supposed to be closely analogous with the process of habit formation in the individual. Just as a skilled craftsman has carried out an action so often that it is accurately performed with little or no consciousness of the details of the muscular action; so, it was suggested, an instinctive action was one which had become automatic and innate through repetition by successive generations.

This is clearly a question of the greatest practical importance in social and educational psychology. If acquired mental achievements were inherited, we should not be starting afresh in the teaching of each successive generation of children at school. The possible intellectual achievements of a child would be dependent not only on his own innate ability and on what he learned at school or at home but also on the inherited effects of the education of his parents. Education in successive generations would thus be a process with cumulative effects. So also would the effects of the social conditions under which people lived. Racial improvement could follow amelioration of social conditions, whereas if acquired characters are not inherited, racial improvement can only result from natural or artificial selection of the fittest to be the parents of the new generation.



The problem of the evolutionary origin of innate behaviour tendencies is clearly the same as the biological problem of the origin of inherited physical structures. The view that what is acquired by individuals may be inborn in their descendants, is commonly known as the Lamarckian hypothesis.<sup>136</sup> At the present day, the Darwinian hypothesis is generally accepted by biologists. On this view, species show inheritable random variations of physical structure and of behaviour tendency, and those variations serviceable to survival are retained as inheritable characters simply because those individuals which possess them are most likely to survive in the "struggle for existence" and are thus most likely to have descendants. This hypothesis does not require the Lamarckian assumption of "the inheritance of acquired characters."

There are two principal reasons for this preference for the Darwinian hypothesis. First, since Weismann stated the principle of the "continuity of the germ plasm,"<sup>253</sup> it has seemed difficult to account for the inheritance of acquired characters. Such inheritance would require that a structural or behaviour change occurring during the lifetime of an animal would so modify its germ cells as to cause a tendency for the same change to appear in its offspring. It is very difficult to conceive of any mechanism by which such a modification could take place. Secondly, the large amount of experimental work designed to discover whether any instances of inheritance of acquired characters can be produced experimentally has generally shown negative results.

Yet the case against the Lamarckian hypothesis is not conclusive. Scientific conclusions drawn from the limits of what we can conceive are notoriously uncertain. Positive results of experiments on the inheritance of acquired physical characters have also been claimed, although these are few. The principal are those of Kammerer.<sup>124</sup> Other biologists have, however, not been satisfied by Kammerer's experiments.<sup>170</sup>

The results of experiments on the inheritance of acquired behaviour tendencies have also been mostly negative. Rats trained in a maze were found to show no inherited effects of training.<sup>260</sup> Pavlov claimed to have demonstrated the inheritance of a food-seeking conditioned reflex in mice,<sup>180</sup> but this claim was afterwards withdrawn.

Experimental evidence of inherited results of training is, however, reported by McDougall.<sup>156,157</sup> He contended that if Lamarckian inheritance takes place, it will not be of those changes which have happened fortuitously to the animal (such as cutting off its tail) but of those that are results of its conscious efforts towards an end. He found that when rats were trained through successive generations to swim to the more dimly lighted of two exits from a tank of water, their offspring were more easily trained in the same performance.

Some of McDougall's results do not appear to be significant when critically examined but the improvement of successive generations of rats trained in the tank is clearly significant. It does not, however, follow that this improvement was due to inheritance of the learned behaviour of the rats' ancestors. Crew has repeated McDougall's experiments and found no difference at the end of 18 generations between his experimental group of rats and the control group of rats bred from untrained parents.<sup>288</sup>

McDougall's positive results may have been due to some process of unwitting selection of the quickest learning rats for breeding. Such selection might take place in many ways: by the tendency of the experimenter to select from a litter the most active young for future breeding, by lowering of the fertility rate of the slowest learners by the number of severe electric shocks they must experience in the course of training, or by a possible tendency for the quickest learners to thrive best in the climate and conditions of the experimental laboratory. The inadequacy of McDougall's controls made it possible for such factors to

pass undetected. These results also, therefore, cannot be accepted as adequate evidence for the inheritance of acquired behaviour tendencies.

### **3. The Stimulus-Response Formulation of the Laws of Learning**

The laws of learning are very commonly stated in terms of bonds or connections formed between stimulus and response. This nomenclature, introduced by Thorndike, has been very widely adopted by American psychologists. The relationship is very commonly symbolised by the diagram  $S \rightarrow R$ . The fact of learning can be represented as the strengthening of a bond, the simultaneous weakening of other bonds, or the replacement of one  $S$  by another. Thus, in a later work, Thorndike states the law of effect as follows: "When a modifiable connection between a situation and a response is made and is accompanied or followed by a satisfying state of affairs, that connection's strength is increased; when made and accompanied or followed by an annoying state of affairs, its strength is decreased."<sup>239</sup>

There seem to be two objections to such formulations of the laws of learning. In the first place, the bond is hypothetical; what is actually observed is behaviour and its changes. If laws can be stated only in terms of what is observed, they are more firmly grounded than if they are stated in terms of hypotheses which may have to be changed.

Secondly, the  $S \rightarrow R$  hypothesis does not seem to be a very firmly grounded one. It is obviously derived from associationist habits of thinking, and the implication of the "bond" would seem to be that of a localised nervous connection between the receptor and effector nerve fibres. We shall see in the next section how strongly the experimental facts point away from any such explanation of learning. We have, therefore, not only the objection that our fundamental laws should contain the minimum of

hypothesis but also that this hypothesis seems particularly likely to be misleading.

#### 4. Physiological Explanations of Learning

It is natural to ask by what nervous mechanism the process of learning takes place. There is an obvious physiological explanation of all the phenomena of memory and of habit-formation, which was put forward very early and with minor modifications has survived until the present time although its weaknesses are being increasingly recognised. It is that the passage of a nervous impulse along a particular neural path facilitates the subsequent passage of a nerve current along the same path. Thus nerve tracts frequently used more readily transmit nervous impulses, which might be supposed to be the fact in the nervous system corresponding to the facts in behaviour summarised by the law of exercise. Thus, William James said: "A path once traversed by a nerve-current might be expected to follow the law of most other paths we know and to be scooped out and made more permeable than before."<sup>113</sup>

In modern statements of this theory it is possible to be a little more specific as to which part of the neural tract might change. We know that in a single neurone, conduction takes place in any direction and there is no mechanism by which facilitation or blockage of a nerve current could take place inside the neurone. The action is therefore transferred to the point of junction between two neurones, the *synapse*, which is supposed to impose the unidirectional property on nerve impulses, and which might be capable of facilitating or blocking impulses. If the above explanation had been written now, "decrease of resistance at synapses" would have been substituted for "the scooping out of a neural path." Obviously this substitution does not make any essential difference to the principle.

The objection to this explanation is that it is too simple to fit the complexity of the facts to be explained. If the

problem of learning were simply to explain how a single muscular response to a simple sensory stimulus was more easily repeated on a second repetition of the same stimulus, the explanation might be adequate. We find, however, in fact, that in a learned response, just as in an unlearned one, a certain pattern of stimulation irrespective of the particular end-organs stimulated, gives rise to a certain pattern of response attaining a single end by the use of one or another set of muscular movements. In such a learned response, there can be no part of the path of nervous conduction common to all the circuits between receptor and effector systems, so that facilitation or lowering of synaptic resistances is of no value to explain the fact of learning.

Let us consider a simple case of human learning by heart. We have learned the line: "The curfew tolls the knell of parting day." Can our power to repeat the first two words be explained by supposing that the synaptic resistance between the process aroused by the word "the" and "curfew" has been lowered? The same laryngeal muscles are used but for every word a different pattern of response has been started and probably a different pattern of brain process. We cannot suppose that a particular nerve fibre conveys the sensory impulse from a particular word either from the laryngeal apparatus to the cerebral cortex or within the cortex itself. Even if we could, no lowering of resistances to nerve conduction could explain the emergence of "curfew" as the word following "the," since the next time "the" occurs it calls up not "curfew" but "knell." Between which of these two words and "the" has synaptic resistance been lowered? Also we may notice that, having learned this passage, we can write it as well as say it, using therefore a totally different set of muscles and getting a totally different set of sensory impulses from our activity.

These are considerations drawn from common observation. They are confirmed by experiments on animal

learning. Whenever we attempt a crucial experiment to decide whether animal learning can be explained in terms of conduction along a special system of nerve tracts, the expectations aroused by this hypothesis are falsified. A rat, for example, is trained to react positively to a white triangle on a black background.<sup>75\*</sup> What now will be his reaction to a black triangle on a white background? On the hypothesis that learning depends on facilitation of nervous impulses along certain tracts, this should be a totally different system of stimulation since now the parts of the retina are stimulated which were not stimulated before and the parts of the retina which were stimulated before are not stimulated now. The rat, in fact, reacts to the black triangle in the way he has been trained to for the white one, even though he has also been trained to react negatively to a white circle on a black ground, which is, so far as stimulation of retinal areas goes, more nearly equivalent to the white triangle.

We may admit that the only explanation of learning which will ultimately be satisfactory will be one which explains its physiological mechanism. No such explanation exists yet, but psychology is a young science. It is better to admit that here we have a problem unsolved than to delude ourselves by accepting bogus explanations based on speculative physiology.

## 5. Human Learning and the Laws of Learning

The laws of learning can give no complete account of the acquisition of human patterns of conduct and thought since these are not merely habit systems and are not wholly acquired by the simple and mechanical processes described in the laws of learning, such more complex processes as insight and volition also playing a part. Nevertheless a good deal of light is thrown on the more mechanical side

\* Similar experiments were done earlier by Lashley with the same results <sup>139</sup>

of the acquisition of verbal habits and also of bodily skills by studies of the laws of learning.

The influence of the law of exercise is universal and is universally recognised. Repetition of the mental or bodily activity to be learned is the usual method both in learning by heart and in acquiring a skilled system of movements such as that of a service in tennis. Knowledge of the law of exercise may help the discouraged learner or teacher by giving the assurance that a sufficient amount of repetition under appropriate conditions will result in the formation of the required habit system.

Knowledge of these appropriate conditions is, however, necessary if learning is to be carried out economically since mere frequency of repetition is now known to play only a minor part in learning. Effective motivation is necessary for learning to take place. An enormous number of repetitions made passively without the intention to learn are proved to be ineffective compared with a much smaller number made with effort to retain the learned material. As Thorndike showed in his experiments with cats,<sup>288</sup> self-directed activity is necessary for effective learning and the mere experience of being "put through" a new set of movements is not sufficient. The same is true of human learning. When Ebbinghaus learned nonsense syllables by reading them over and then trying to repeat them,<sup>289</sup> it was the activity of repetition and not the initial reading over that was most effective in making subsequent recall possible, although the initial reading over must have had some effect on learning since, without it, the active repetition would have been impossible.

This is understood in school learning where activities of problem solving, map drawing, etc., are known to be more effective methods of learning than passive listening to teaching. In modern systems of education, such active methods are used more widely. Similarly the student wishing to teach himself statistical methods will work out problems for himself and not hope to learn the methods

by the relatively uneconomical way of merely reading the explanations in a textbook.

The general principles of the law of effect seem also to be widely recognised outside the psychological laboratory. The whole system of reward and punishment seems to be based on a popular belief in the efficacy of trial and error learning more simple and thorough than that of most psychologists. Crime, for example, leads to imprisonment which is not only unpleasurable but also thwarts the ends for which the crime was committed. Imprisonment may thus be expected to have the effect of stamping out criminal lines of behaviour. Socially recognised methods of enriching oneself, on the other hand, lead to success in this aim and to the other rewards of a respectable life. So such lines of conduct should be stamped in.

That this method is not completely successful may be partly due to the fact that failure and punishment are not sufficiently certain rewards of crime. For successful stamping out of criminal systems of behaviour by the principle of effect it is not necessary that punishment should be severe but it is necessary that it should be certain, whereas in fact the habitual criminal may be more successful than his honest neighbour. It is also probably due in part to the fact that the psychological situation is more complicated than that of Thorndike's cats. Punishment may lead to an emotional habit system of rebellion against society which stimulates further criminal activity, as well as strengthening social bonds with other criminals.

Punishment and reward in schools seem to be similarly founded on a popular belief in the effectiveness of pleasure as a method of stamping in bonds and of the much greater effectiveness of unpleasure as a method of destroying bonds. It is a thoroughly bad teaching method because there may be undesirable secondary consequences of punishment. A child beaten for making mistakes in spelling may not, as the teacher hopes, simply learn to avoid those mistakes in future. We know that experimentally



an avoidance reaction may spread over many similar or contiguous things besides the one immediately associated with the painful experience that caused it. The child may show consequent aversion to all spelling (correct as well as incorrect) and even to all book learning. Similarly a baby smacked for dirtying its napkin may, as a result, have a neurotic difficulty in excretion under all conditions and not only in the special condition against which the smacking was directed.

Punishment is older than the enunciation of the law of effect. Its use is due to a popular recognition of the truth underlying that law, and to a lack of recognition of other psychological principles which may interfere with its effectiveness. So far from the practice of punishment being a result of experimental psychology, the influence of psychologists has in general been against the current dependence on punishment and reward, particularly in schools. There are other directions in which the results of experimental investigations of the law of effect have directly influenced current practice.

One is to be found, I think, in the popular belief in the sole efficacy of the law of effect in the acquiring of behaviour patterns by young children. The young mother is taught in the name of psychology that she must on no account go to her child when he cries in bed. The reason given is (in accordance with the law of effect) that if the cry is successful in obtaining the presence of the parent this behaviour will tend to be repeated. Thus the child can only be taught not to cry by finding that the attempt to obtain the parent's presence is not successful. It must not be forgotten, however, that the law of exercise is also to be considered and the fact that the child goes on crying the first time will, other things being equal, make it more likely that he will develop a habit system of crying in bed. More serious is the consideration (made clear by the work of the child psycho-analysts) that the child may be crying because he is suffering from anxiety.<sup>129</sup> If that anxiety

is relieved by the presence of the parent the child is less likely to form a habit system of crying than if the anxiety is left unallayed, which also may have other bad effects.

There is, in general, a considerable danger of oversimplification in the application of the laws of learning to human beings. Even the child is not a simple piece of mechanism and no one simple principle suffices to explain how his behaviour patterns are acquired.

Part of the acquired behaviour patterns of human beings can also be explained by the principle of the conditioned reflex. Some writers have, indeed, regarded this as the basic principle of all human learning. The use of punishment, which we have taken as an example of the law of effect, might equally well be treated as an example of the formation of a conditioned reflex—the avoidance which is the unconditioned response to the punishment itself becoming the conditioned response to the offence punished. It must be remembered, however, that only by a considerable stretching of the term “reflex” can we apply it to the socialised behaviour which is the method by which the criminal released from prison avoids further imprisonment.

Of human acquired behaviour, the part that comes nearest to the pure conditioned reflex is the system of acquired emotional responses, fears, food dislikes, etc. On its physiological side, an emotion is a system of reflex responses in the automatic nervous system and the endocrine glands. In a series of somewhat inconclusive but widely published experiments, J. B. Watson demonstrated the formation of a conditioned fear response in a young child.<sup>264</sup> He found that originally the child (11 months) only showed fear responses to loss of support and loud sounds.\* There was originally no fear response to

\* No indication is given, however, of how Watson knew that the stimuli tested were exhaustive of possible fear producing stimuli. Partial suffocation, isolation, and the expression of fear by the person holding the child all seem from common observation to be likely unconditioned stimuli to fear.

a white rat. Then each time the rat was presented a loud noise was made with an iron bar producing the fear response. After a few repetitions the rat alone produced fear, as did also a rabbit, dog, or a fur coat. Watson believes that all fears arise in this way by conditioning from the few fears which are genuinely original.

Later he demonstrated that a child could be "unconditioned" of fear of an animal by reconditioning to the pleasurable response to eating food. The method was to introduce the animal while the child was eating, at a considerable distance at first then gradually nearer until the child showed the conditioned response of pleasurable feeling to the presence of the animal alone. Petting or laughter might have been substituted for eating in this experiment. These are methods widely used by parents.

The possibility of children being conditioned to fears in this way should be borne in mind by those who have charge of them, and the methods of unconditioning are of practical value. It may be doubted, however, whether the serious fears are formed in this way. Watson cheerfully says of the first child mentioned that he is conditioned to fear of rats for his whole life unless someone unconditions him, but this is not proved.

In the absence of adequate experiments, one must rely on random observation. My own observations lead me to suspect that most children's fears do not have such a simple history and that those that do are transitory. A small girl of about four years showed no fear of large animals in a zoo. Then one day the elephant trumpeted near her. She showed fear and was unwilling to go near the elephant again that day, but on the next visit the fear had completely disappeared. This was fear like those reported by Watson conditioned to a loud noise, but it was very impermanent. Later when she had no fear of the elephant behind bars, she showed uneasiness and wished to be taken away when the door behind the elephant's cage was open. This was an acquired fear, dependent not on conditioning to a pre-existing fear but on an insight into the total situation (an imperfect insight, as it happened, because there was still a fence between her and the elephant). Similarly she showed no fear at about three years when sailing in a boat but developed fear when

small amounts of water splashed into the boat through the casing of the centre-board (water itself did not produce fear). When less than a year old she showed fear when a dog snarled in anger in another room although she showed no fear at the much louder noise of the same dog growling in play in the same room.

These are only isolated observations but they indicate directions for research if we are to have a really scientific account of the nature and origin of acquired fears. Nor can we afford to neglect the possibility that a large number of fear objects are provided by the phantasies of young children and that fears will be permanent or temporary according to whether or not they reinforce these phantasies. Evidence of a basis of fear-charged phantasies on which later phobias may be built is to be found in the writings of child analysts. Such possibilities have been altogether ignored in experimental investigations.

Much the same may be said of the adult phobias. Let us take, for example, the classical account of a case of claustrophobia investigated by Rivers.<sup>202</sup> This was a doctor who was afraid to enter into an enclosed space (such as a dug-out or an underground railway). It was found by Rivers that the origin of this fear was an incident which had occurred when he was very young and was frightened by being attacked by a dog in a dark passage. This incident had passed completely from his mind, and when, as a result of treatment, it was restored to consciousness his fear of enclosed spaces disappeared.

The explanation of this event, on the conditioned reflex theory, would be that the visceral and vaso-motor reflexes of fear were called out by the dog situation (as an unconditioned system of reflexes). This occurred in conjunction with the enclosed space situation, and the automatic reflex response of fear was thereafter conditioned to any enclosed space situation. Hence the claustrophobia. Because the cause of this condition had vanished from consciousness, and therefore could not be made the subject of rational thinking, it remained a response on the reflex level. When brought into consciousness the groundlessness of the fear response to the dark passage situation was seen and the system of conditioned reflexes disappeared.

It is unlikely, however, that this is a full account of the matter. The permanence of the fear is in striking contrast with the transitoriness of the conditioned reflex when the second stimulus is presented repeatedly without the stimulus originally producing the reflex. It seems more likely that the incident with the dog acted

by reinforcing an already existing tendency to fear in enclosed situations, this tendency itself being either innate or the result of some still earlier fearful experience of the patient, either real or elaborated in phantasy or both. This explanation is rendered more probable when we consider how common is the fear of enclosed places; conditioned fear reflexes formed fortuitously might as well be attached to one kind of situation or object as another. The experience of being born has been suggested as the original source of all such fears, but this is a mere speculation, not supported by controlled observation.

## CHAPTER V

### THE EMOTIONS

#### 1. Emotion

Of those determinants of human behaviour which are inherited parts of man's psycho-physical constitution, the most important are his dispositions to experience certain emotions and to show the characteristic emotional behaviour which accompanies them. The normal man in different situations shows a variety of these responses of which fear, anger, wonder and grief are examples.

The dominant element in the state of mind of a person under the influence of emotion is *affect* or *feeling*. It is also characteristic of emotion that this feeling is attached to some object or situation; we normally feel afraid "of something," and if this outside attachment is absent, we do not speak of an "emotion" but of an "anxiety state." Also it is characteristic of an emotion that it is a total state of mind which includes a *conation* or impulsion to some line of behaviour.

There are other conditions into which affect very largely enters; *moods* for example, are feeling states more prolonged than emotions, less connected with any external object or situation, and with less impulsion to any course of behaviour. We may use the name *affective state* as a generic term for all such conditions in which the feeling element plays a large part.

An emotion contains an impulse to some kind of action which is associated with the initial affect in such a way that the affect becomes stronger if the impulse is not obeyed, but is dissipated if the behaviour dictated by the impulse is carried out. Thus the strong and somewhat unpleasant affect belonging to the emotion of anger is associated with an impulse to the violent behaviour of

attacking the person who has produced the anger. If (as is ordinarily the case in organised society) this mode of behaviour cannot be carried out, some relief to the affect is obtained by violent abuse of the person. If neither of these modes of behaviour can be carried out, the affect becomes unpleasantly strong. A certain amount of relief can, however, be obtained by the creation of a mental phantasy of the injury or degradation of the person who was the object of anger, or by violent behaviour which is not directed against this person. This directing of emotional behaviour in some other direction than that of its true object has been called *displacement of affect*. It is also to be observed in such responses as that of a child whose tenderness is aroused by the sight of another child, and expresses itself not by kissing the other child but by kissing its own mother.

It is necessary to notice that in ordinary speech we speak of "fear," "anger," "love," etc., as if these were names for distinct states of mind distinguishable by their quality as feeling. I do not think that this is the case. The different emotional names are given to the feeling states we experience in different practical situations; the feeling states themselves may vary more in the course of any one situation than they differ amongst themselves. Thus as feelings, the states of mind we experience when we say we are angry and when we say we are afraid may not be very different.\* We distinguish them because in the one case we find ourselves fighting and in the other case preparing to run away. Nor could we perhaps distinguish introspectively the unpleasant feeling of rejected love, and of unsatisfied hunger. The emotional names are determined by the different practical situations in which occur feeling states themselves not sharply distinguished.

A single emotional name is given to a succession of feeling states which vary very widely amongst themselves. An emotion is a process in time, not an instantaneous state of mind. If we

\* This must be borne in mind when we consider what weight to attach to the argument against the James-Lange theory that different affective states may have very similar visceral accompaniments (see § 6)

are attacked by a dangerous animal, during the course of behaviour which ends by our putting a fence between ourselves and the animal we are likely to have experienced many varieties of affect from a tense and highly unpleasant one at the beginning to a relaxed and pleasurable one at the end. Yet all of this is commonly expressed by saying that we felt "fear." It is clear that this one word "fear" may cover greater differences of affective state within itself than may exist between two emotional conditions described by different names.

This consideration should make us unwilling to draw any conclusions from a method of treating emotional names as if they stood for different and distinguishable entities. For example, McDougall says that a single instinct (or propensity) can be distinguished by the fact that it has associated with it "one kind of emotional excitement whose quality is specific or peculiar to it."<sup>153</sup> The truth would appear rather to be that, for practical reasons, a name is given to the emotional processes that accompany behaviour directed towards a single goal although there may be little that is specific or peculiar about the affective aspect of these processes.

McDougall calls the specific emotional states belonging to single instinctive tendencies the "primary emotions," and regards other "secondary" emotions as blends of these.<sup>153</sup> Admiration is thus regarded as a secondary emotion compounded of the primary emotions of wonder and negative self-feeling, as purple is a secondary colour compounded of the primary colours red and blue. This distinction between primary and secondary emotions implies necessarily that the primary emotions are different and distinguishable entities. If we accept the view that has been suggested above of an emotion as a process in time containing many varieties of affect not peculiar to it, we cannot suppose that there is any reality in these separate primary emotions.

## 2. The Sympathetic and the Disinterested Emotions

An emotion is generally the response of a person to the situation in which he finds himself—fear to his own danger, anger to his own injury, and so on. But these same emotions may be called out as responses to two other kinds of situation both related to other people. First, we may experience the emotion of fear when we hear the scream



of a frightened person, or anger when we hear a friend's voice raised angrily and see his threatening gestures towards some person who has injured him. Here the situation calling out our emotion is the outward expression of some other person's similar emotion. The emotion called out in this way may be called *sympathetically induced emotion*, or, more shortly, *sympathetic emotion*.

We may, however, also experience emotion as a consequence of the perception of a situation affecting another person. We may feel fear when we see another person on the point of being run down by a bus which he has not seen, or when we watch a child playing at the edge of a cliff unconscious of its own danger. Similarly we may feel anger at an injurious or insulting speech about another person which he has not himself heard. Emotion called out in this way on behalf of another person may be called *disinterested emotion*.

It should be clear that we are here dealing with two different kinds of situation in which emotion and its accompanying impulse to behaviour may be called out in a situation primarily affecting not ourselves but other people. It is true that both kinds of situation may arise at the same time, as when we both see another person's danger and hear his cries of distress. This is perhaps why they are commonly confused. They may, nevertheless, act independently and either alone may be sufficient to produce emotion and its accompanying behaviour impulses. They are two different tendencies to emotion arising in different situations. If it is desired to use a generic term which will include both tendencies to emotion, they may be both called "altruistic emotions."

The altruistic emotions are of obvious importance in social behaviour. Of the two classes of altruistic emotion, sympathetic emotion appears to be the more widespread in the animal kingdom. Indeed it is probably a very important part of the mechanism by which simultaneous

activity in the same direction is secured amongst social animals. Bees engaged in attacking behaviour produce a higher note in their buzz, which appears to be a stimulus to attacking behaviour by other members of the hive. The snarl of an angry dog and the yap of a hunting dog appear to serve the purpose of stimulating other dogs to the same emotional excitement and to the same behaviour.

It is mainly in situations where a large number of people are gathered together in a crowd that the sympathetic induction of emotions has importance in the social life of human beings. Principally as a result of the entertaining but superficial writings of LeBon,<sup>141</sup> the discussion of crowd psychology has attained in the past a prominence in social psychology out of all proportion to its real importance. The method adopted by LeBon of studying actual crowds and then applying his conclusions generally to phenomena of social life in which there is physically no crowd is not scientifically justifiable.

A crowd is a large aggregation of people in physical contiguity. It is a condition in which the expression of an emotion by some individuals has the maximum opportunity of being sympathetically induced in others. Since those in whom emotion is induced will by their own cries and gestures induce it in others and reinforce it in those who already share it, crowd emotions can attain a very high intensity and can produce activities of fear or ferocity or jubilation more intense and more intolerant of the barriers of ordinarily accepted prohibitions than any of which the members of the crowd would be individually capable. Thus we give the name "panic" to the intense fear and uncontrollable reaction of escape produced in a crowd by such reinforcement through sympathetic induction.

Disinterested emotion seems to be less common amongst animals than sympathetic emotion. Bee-keepers report that bees will attack an operator who crushes some while he is manipulating their hives. Only careful experiment

can determine, however, whether this attacking behaviour is a sympathetic response to some signal made by the crushed bees or a disinterested response to the fact of their death (we can guess that the former is the more likely explanation). Hunters report angry behaviour of baboons and oxen when one of their number is injured or threatened, which appears from the descriptions given to be truly disinterested and not only sympathetically induced emotion. In any case, it is certain that disinterested emotion is found amongst animals when they are engaged in parental activities. A mother cat will ferociously attack a dog (which under normal conditions she would run from) if he approaches her kittens even when these are too young to show any emotional response themselves.

Apart, however, from parental behaviour, disinterested emotion seems to be relatively rare amongst animals. Köhler observed that if one chimpanzee was distressed by isolation from its fellows, these were little affected by its situation.<sup>133</sup> Occasionally its cries of distress would induce another chimpanzee to embrace it through the bars but the actual cries were essential for this behaviour to appear. Similarly, we may notice amongst dogs, a general tendency to respond to emotional expression by other dogs but relative indifference to what is happening to these other dogs if they do not react vocally.

Amongst human beings, on the other hand, disinterested emotion is of considerable importance as a motive of a large part of the activity of every individual on behalf of other persons. As amongst the other animals, it is strongest as a response organised in the parental and the sexual systems of behaviour. A timid mother whose child falls into the water jumps in herself without any volitional effort and pulls it out because the impulse of disinterested fear called out by the danger of her child is prepotent over her own individual fear.

In non-reproductive social relationships, disinterested emotion is still present as a motive to behaviour. The moralist

may deplore that it is a very much less strong motive force than individual emotion and that it often is not an effective motive under conditions in which it is desirable that it should be effective. We should, however, be misunderstanding the sources of social human behaviour if we ignored it. Its existence as a potential motive is known by those whose practical business it is to influence human conduct. Appeals for subscriptions to charities, propaganda for warlike action on behalf of the oppressed and maltreated inhabitants of an invaded country, all assume that this potentiality exists and may be made active by suitable methods of representing the sufferings to be relieved. Their success proves that the assumption is correct. We can be stirred emotionally by the dangers and sufferings of other people without witnessing their actual expressions of emotions, although, of course, far less strongly than by our own dangers and sufferings or by those of our families.

The effectiveness of disinterested emotion is obviously determined by the individual's group affiliations. He feels disinterested emotion most strongly on behalf of members of any group to which he himself belongs. He may be less distressed by the death of a million persons through a flood in China than by the drowning of ten persons in his own village.

Class grouping as well as local grouping is a factor in determining the strength of disinterested emotion. An individual may be much more moved emotionally by the misfortunes of members of his own occupational group suffering persecution in a foreign country than by the distresses of those of his own country of a different social class from his own.

Sympathetic emotion seems on the other hand to be less limited by group affiliations. The hearing of a scream of fear seems to arouse immediately the fear response whether or not the person screaming is closely linked to us by race, class, etc.

### 3. Weakness of Disinterested Emotions called out by Mental Representation

While the disinterested emotions are called out readily in the actual presence of other persons in distress, they are called out much less readily and less strongly by the mere thought of the distress of others. This is only one example of the general truth that all emotional responses appear much more readily to actual situations than to imaginal representations of those situations. The case of the disinterested emotions is, however, of particular importance, for it produces a serious practical problem in modern social conditions.

Society is, at present, so organised that our decisions and actions frequently have great effects on the happiness or unhappiness of other persons whom we cannot see. The decision of a group of employers about wages, of a municipal authority about the evacuation of houses, or of the electors of one country about the steps to be taken for the recovery of debt from another, may have grave consequences in the happiness or unhappiness of the persons affected by the decision. These consequences may even be the misery and starvation of a large number of persons. Yet the persons making the decision are likely to feel disinterested emotion only very weakly on behalf of those affected by it, for the latter are too remote to call up vivid disinterested emotion. Similarly, our contributions to hospitals and relief funds would be given readily if we could actually see the sufferings we relieve, and appeals for these causes often try to make the sufferings as vivid as they can by striking pictures or by vivid description.

To this failure of the disinterested emotions to respond readily to merely imaginal representation is due much of what is commonly attributed to heartlessness and cruelty in modern social relationships. It is probably not true that we are more heartless or less easily influenced by disinterested emotions than our forefathers, but we live under conditions in which these emotions have less chance of beneficent action for the relief of suffering. The business man who practices and defends "hardness" in his actions with respect to his employees\* would often not hesitate

\* This hardness was rationalised at the beginnings of the industrial era by the economic doctrine that one best served the interests of others by pursuing one's own interest. In this manner Whately defended the action of the corn dealers who raised the price of corn in time of scarcity <sup>164</sup>

to give generously to one of them if he actually visited his home and saw his need.

The disinterested emotions, like the other emotions, were originally responses to actually present situations, and our mental constitutions have not changed in such a way as to adapt us to a changed condition of society in which our responses to imagined situations are of much more practical importance than our responses to actually present situations.

It is true that there is a limit to the amount of such sensitiveness that would be possible for a person who is continually making responsible decisions which affect the happiness of other persons. Life would be intolerable for the business manager who felt himself all the misery which his decisions to cut down the number of his employees would cause; nor could one be a general who felt sympathetically the pain of all the bereavements caused by his decision to order an advance \*

On the other hand, such evils as that of a great part of the population of a prosperous community living under conditions of ugliness, squalor, and need, would be more quickly put right if people generally felt disinterested repugnance against these evils strongly enough to take active steps to remove them. There would be fewer wars if all nations could be free from the influence of enthusiastic militarists whose power of feeling disinterested emotion to imagined situations is too weak for them to be able to react adequately to the miseries which wars produce.

#### **4. The Expression of the Emotions**

There are three kinds of bodily response in an emotional reaction. These are: (1) the behaviour associated with the emotion (such as striking in anger, running away in fear, etc.), (2) other responses in the muscular system particularly in the facial muscles (such as trembling, sneering, scowling, etc.) with certain vocal responses (snarling,

\* The fact that this failure of the disinterested emotions to come into play in the relationship between the employer and employed is unavoidable in large organisations does not alter the fact that it may have serious social consequences. A large body of men under a management which, by its very nature, must be unfeeling in its relationship with them, are in an ideal situation for the formation of hate sentiments against this management.

screaming, etc.) and (3) changes in the blood supply and viscera (pallor and excretion in fear).

The second group forms the important class of what are known as the *expressions of the emotions*. Darwin maintained that some of the facial movements were relics of movements which in time past would have been serviceable to the animal executing them.<sup>57</sup> Thus, the movement of sneering is the baring of the canine teeth preparatory to attack, and the turning down of the corners of the mouth in disgust is a relic of the facial movements which would have been made to get rid of food of unpleasant taste. These methods of expression he called *serviceable associated habits*. Other expressions he explained by a principle of antithesis. The cringing attitude in submission is, for example, the result of a relaxation of the muscles which are contracted in the upright gait of assertiveness. Thirdly, he noticed some expressions, such as the trembling of fear, which seemed to have no evolutionary value. These he considered served no purpose, but were due to the direct action of the nervous system (*i.e.* to the spreading of nervous excitation).

Amongst ourselves observation of facial expression plays a considerable part in the intercommunication of emotion. This is probably unimportant in other animals than the Primates since their faces appear less mobile under emotional changes and are very commonly covered with hair or feathers. Many experiments have been performed showing the ability of human subjects to recognise emotions from photographs. Many of these photographs have, however, been of people not actually experiencing emotion but trying to "register" emotion for the purpose of being photographed. Power of recognising such expressions may, therefore, be different from the power of recognising true emotional facial expressions and be merely the capacity for understanding a conventional set of symbols for emotion which has been adopted for the purposes of the theatre and the cinema screen.

It must be remembered too that it is a convention amongst most civilised (and many uncivilised) men to inhibit the expression of the emotions both vocally and facially. We learn therefore to recognise emotions by the facial and other changes which accompany this inhibition. We may know, for example, that a friend is angry, not because he shows the primitive emotional expressions of a scowl, a raised voice, and angry gestures, but because we see that he is inhibiting these reactions by a slight smile accompanied by a good deal of muscular tension, an unusually soft voice, and general bodily stillness. Unless our experience has taught us to recognise these symptoms of inhibition of emotional expression as signs of emotion, we shall be peculiarly insensitive to what is being felt by those around us.

More generally in the animal world it is the sounds and accompanying movements which serve this purpose of inducing emotion and emotional behaviour. The biological importance of this sympathetic induction of emotions is that it promotes in a group of animals behaviour directed towards a common end. A pack of dogs attacks in concert because the snarls and threatening movements of one induce anger and angry behaviour in the others.

All theories of the origin of language are highly speculative, but it is at least as likely a hypothesis as any other that speech started with emotional cries which were signals for concerted action. Language may have developed through a much greater complexity of such cries than is to be found amongst the higher apes, their emancipation from any necessary accompaniment of bodily behaviour, and the extension of their use to other purposes than that of signalling immediate behaviour impulses.

## **5. The Physiological Mechanism of the Emotions**

The bodily changes in heart beat, breathing, blood supply, etc., which take place on the perception of a



stimulus producing emotion result from the activity of a part of the nervous system to which is given the name of the *autonomic system*. This is a system of nerve fibres and nerve ganglia which have connections with the central nervous system (comprising the brain, the spinal cord, and the nerve fibres from them) but are functionally distinct from it. The autonomic is the nervous system which controls many of the automatic responses of the viscera such as the beating of the heart.

This system is apparently a survival of the diffuse type of nervous organisation which still exists in those primitive animals whose nervous functions have not become, like ours, centralised in the brain and spinal cord. The changes in the viscera and blood supply which take place in emotion result from the action of the autonomic nervous system on the blood vessels or on the unstriated musculature of the skin and viscera which it controls either directly or by causing a secretion from one of the ductless (or *endocrine*) glands.

For example, part of the autonomic nervous system (the *sympathetic* or *thoracic-lumbar system*) produces dilatation of the pupil, a quickened heart beat, and a contraction of the minute blood vessels in the skin and viscera.\* These effects are also produced by injection into the blood stream of *adrenalin*, the substance secreted by the suprarenal gland. In fear and rage, these are the bodily changes that take place. Cannon claimed to have proved that in fear and rage, the changes which took place were direct effects of adrenalin being secreted into the blood stream.<sup>47</sup> Later research has thrown doubt on this view and it is now more commonly supposed that these physiological accompaniments of fear and rage are due to the direct action of the sympathetic nervous system itself on the blood vessels, heart muscles, etc.

\* This vaso-constriction seems to be adaptive and may have, as its biological purpose the reduction of bleeding from an injury received in a fight.

It is probable, however, that other emotional conditions are directly conditioned by secretion of a hormone from a ductless gland. Wiesner has shown that injection into a female rat's blood-stream of certain extracts from secretions of the anterior lobe of the pituitary gland produces the maternal behaviour of retrieving young.<sup>269</sup> In other words, this injection produces a result in behaviour of a similar kind to that produced by tender emotion in the human mother. It is very probable that the physiological accompaniment of this tender emotion is such a pituitary secretion and that this secretion is the physiological source of the energy of the maternal drive. It is also very likely that the experience of sexual emotion is the psychological accompaniment of a similar glandular secretion.

Although much is known of the effects of hormones on growth and on the development of secondary sex characters, very little is known of how far changes in emotional states are conditioned by changes in the amounts of different hormones secreted by the endocrine glands. Although there is good reason for suspecting that the endocrine glands play a large part in the production of the physiological changes accompanying emotion, there is, at present, very much more speculation on this subject than exact experimental knowledge.

## 6. The James-Lange Theory of the Emotions

William James<sup>113</sup> and a Swedish physiologist named Lange<sup>137</sup> put forward at about the same time theories of the nature of emotion, which, although not identical, were sufficiently alike to be generally treated as one theory under the name of the *James-Lange Theory of the Emotions*. The bodily changes mentioned in the last paragraph have always been noted as accompaniments to emotion, and its intimate connection with the viscera is suggested by many phrases which attribute love to the heart and sorrow to the bowels. Descartes<sup>64</sup> even said that certain emotions

were caused partly in the viscera and not merely in the brain.\*

Now, there are certainly affector nerve fibres by means of which we can have sensations derived from changes taking place in the viscera and in the circulation of the blood. The essence of the James-Lange theory was that these sensations of visceral and vaso-motor changes was the emotion.

James stated this theory sometimes in terms which were open to obvious criticism. He spoke, for example, of the visceral changes *causing* the emotions, and said that we do not cry because we are sorry, we feel sorry because we cry.† Less open to obvious objections, however, was his more considered statement that "the bodily changes follow directly the perception of an exciting fact, and that our feeling of the same changes as they occur is the emotion." The principal evidence brought forward by James in favour of this statement was that if we think away all the bodily accompaniments of an emotion there is no emotional content left at all.

The James-Lange hypothesis has the merit that it is easy to devise tests of its truth or falsity. If emotion is the feeling of certain bodily changes, then emotion and emotional behaviour should be absent if the bodily changes

\* "the cause of them [love, hate, desire, joy, and sadness] is not, as is the case with wonder, in the brain alone, but also in the heart, the spleen, the liver, and in all other parts of the body, in so far as they serve in the production of the blood, and thereby of the spirits" (Art. XCVI.)

† This formulation is objectionable for two reasons. First, James obviously did not mean that sorrow was the sensation merely of the secretion of the lachrymal glands. Secondly, one must object to the unnecessary introduction of the conception of cause. The statement that the sensation of the visceral change *is* the emotion (or, rather, the affect) is in no way helped by saying that the visceral change *causes* the emotion. Ribot was willing to accept everything of the James-Lange theory except the statement that the visceral change caused the emotion, which seemed to him as philosophically objectionable as the older statement that the emotion caused the visceral change.<sup>201</sup>

cannot be felt, they should be present if the bodily changes are present and felt even if they have been produced artificially and not by the perception of an emotional situation, and lastly, different emotions should be accompanied by different bodily changes. Experimental research shows that none of these expectations is fulfilled.

First, Sherrington showed that dogs with the spinal cord severed in the lower cervical region could express affection, fear, and anger although they could not be receiving any sensations from their viscera.<sup>214</sup> Secondly, it has been shown that the injection of adrenalin produces artificially the same visceral and vaso-motor changes as take place in fear, but that persons who have had such an injection do not feel fear in the absence of a fear-producing idea or situation.<sup>215</sup> Thirdly, Cannon has shown that such different emotions as fear and rage have the same visceral and vaso-motor accompaniments.<sup>47</sup>

The James-Lange theory cannot, therefore, be accepted as it stands. James and Lange may well have been right in considering that afferent nerve impulses from the viscera and vaso-motor system produced an important constituent in the affective element of emotion. They were clearly wrong in stating that such impulses were necessary and sufficient conditions for emotion. An emotion is a reaction in which the central nervous system and peripheral parts of the body both take part. There is no reason for supposing that the peripheral parts of the reaction are the only important ones; Sherrington's experiment suggests indeed that the central part of the reaction can take place without them.

That the affective character of an emotion would be entirely different without these peripheral physiological accompaniments we may readily believe. James maintained that if we think away all the bodily sensations from an emotion, nothing is left behind but a cold and neutral state of intellectual perception, and said that most people could verify this statement by introspection. This is not,

however, a true introspective observation. We can imagine that we know what a state of mind would be like without some of its actual constituents but we cannot directly experience it. We cannot find out by any introspective process what a state of fear would be like without the pallor of the skin, and the unpleasant sensation in the digestive organs. We can only know that it would be different—probably less unpleasant and possibly with less tension towards escaping behaviour. It is certain that much of what we call emotional experience is made up of visceral and vaso-motor sensations, and it is possible that the strength of the behaviour drive in emotion is partly the organism's reaction to these changes. If this is the case, much of the James-Lange theory is true, although it is not the whole truth.

### 7. Qualities of Feeling

An emotion (or any other affective state) may be pleasant or unpleasant. So also may other states of consciousness; some sensations are acutely unpleasurable. In ordinary speech we commonly give the name of "pain" to the quality which is the opposite of pleasure. Such a usage would, however, cause confusion in psychology since this word is also used for a particular kind of organic sensation such as given by a sharp point applied to the skin or by a decaying tooth. The organic sensation of pain is generally acutely unpleasant, hence the popular confusion of the two ideas under one word, but, if it is small in intensity, a pain may be not unpleasant and may even be pleasurable. Also some extremely unpleasant experiences (such as some smells) have none of the character of pain sensation. The term "unpleasure" is therefore generally used in psychology as the opposite of pleasure. The name "affective tone" (or "feeling tone") is commonly given to these opposite feeling qualities of pleasure and unpleasure.

While pleasure and unpleasure are generally produced as reactions to the environment, they may be produced entirely by changes in the condition of the organism without any external exciting cause. Thus, Head showed that moods of acute unpleasure are symptoms of some forms of visceral disease,<sup>97</sup> while pleasure is often a symptom accompanying the last stages of consumption. Emotions also may be purely endorganic in their origin, as, for example, the fear which accompanies attacks of angina.

The behaviour concomitants of pleasure and unpleasure are the *seeking* and *avoiding* reaction respectively. A pleasurable emotion has as its impulse a reaction which belongs to the seeking class and an unpleasurable emotion is similarly attached to a reaction of the avoiding class. A pleasurable mood accompanies the harmonious functioning of the bodily organism, while a mood of unpleasure accompanies any failure to attain such a harmonious functioning (e.g. in disease, in excessive fatigue, or in a hostile external situation).

It is probable that the feeling qualities of pleasure and unpleasure are among the most primitive elements in mental life. It can be shown that they have as their organ a primitive part of the central nervous system. Head and Holmes have found that if the *optic thalamus* (an organ in the mid-brain) is cut off from the cerebral cortex there is a resultant change in behaviour and feeling which may be described as *affective overweighting*.<sup>98</sup> Pleasurable sensations are felt as exquisite, unpleasant ones are felt as unbearable and are accompanied by an uncontrollable withdrawal of the part to which the painful stimulation has been applied. The person suffering from such a lesion seems to be reacting in a biologically more primitive way. The behaviour suggests the uncontrolled mass movements of seeking and withdrawing displayed by primitive organisms. The *optic thalamus* is the primitive centre for the pleasure-unpleasure ways of feeling and action, and in the normal person these reactions are very largely inhibited by the cerebral cortex.

It has generally been assumed that the only quality difference between affects is that between pleasure and

unpleasure. Wundt, however, suggested that there were three directions of variation: pleasure—pain, excitation—quiescence, strain—relaxation.<sup>300</sup> Thus an affect might be pleasurable, excited and tense; pleasurable, excited and relaxed, or any other of the eight possible combinations of these pairs of opposites, and a complete chart of possible affects must be a three-dimensional one with three axes representing at their two ends each of these three pairs of qualities. This theory has therefore been called the *tri-dimensional theory* of feeling. It was hoped that measurement of various bodily changes mainly connected with blood supply (such as limb volume, the electrical resistance of the skin, pulse rate, blood pressure, etc.) might, by the different effect on them of changes in these three sets of variables, make possible an objective determination of the affective condition of the experimental subject. This hope was not fulfilled. All of these quantities do change with the affective condition of the subject, but it has not proved possible to correlate these changes with changes in the three variables postulated by Wundt.

Since Wundt's tri-dimensional theory proved not to be supported by experimental evidence, it has generally been abandoned. Common observation of the behaviour of organisms and our own introspections seem, however, to favour a modified form of this theory put forward by C. S. Myers.<sup>174</sup> This is, in effect, a bi-dimensional theory in which Wundt's two dimensions of *excitation—quiescence* and *strain—relaxation* are replaced by one dimension of variation between enhanced and diminished activity.

A favourable environment may lead to either enhanced or diminished activity. The affect which we recognise in ourselves is, in the first case *exhilaration* (or *gladness*), in the second it is *ease* (or *bliss*). Similarly an unfavourable environment may lead to enhanced or diminished activity, and the corresponding affects are *uneasiness* (or *distress*), and *depression* (or *sadness*) respectively. Since we find these four ways of reacting amongst primitive

organisms we may speculate that if they have any consciousness it must be very largely composed of these four modes of feeling: exhilaration, ease, distress and depression.

### 8. Emotion and Instinct

If emotional states could only be recognised introspectively, we should have no grounds for speaking of animal emotions. There are, however, recognisable behaviour characteristics of emotional states. In most animals other than the Primates, changes in facial expression and the effects of changes in the blood supply (pallor and flushing) can be seen with difficulty or not at all. There remain as easily observable characteristics: a general tendency to increased activity, persistence of behaviour directed towards a single goal, and the vocal accompaniments of emotion. If, therefore, we remain strictly behaviourist in our point of view (as we must when studying animals) it is still meaningful to talk of emotion and emotional behaviour.

All three of these characteristics need not be present in any particular case of emotional behaviour. There is no difficulty in recognising emotional behaviour in a terrier looking for a rat. Nor is there in the behaviour of a cat stalking a bird although the cat is silent. Emotional behaviour of courting birds has been vividly described by Julian Huxley.<sup>108</sup>

Of the Louisiana Heron, he reports that, while the pairs are on their territory before nest-building, they sit still for hours at a time with the head of the hen generally resting on the cock's flank, but occasionally this passivity gives place to wild excitement. "Upon some unascertainable cause the two birds raise their necks and wings, and, with loud cries, intertwine their necks. The long necks are so flexible that they can and do make a complete single turn round each other—a real true-lover's knot! This once accomplished, each bird then—most wonderful of all—runs its beak quickly and amorously through the just raised



aigrettes of the other, again and again, nibbling and clapping them from base to tip. Of this I can only say that it seemed to bring such a pitch of emotion that I could have wished to be a Heron that I might experience it "

We must ask what is the function of this emotional accompaniment to instinctive activity. In what way has an innate tendency to carry out a course of action, accompanied by an emotion, a greater survival value than would have the same behaviour tendency with no emotional accompaniment. If it were conceived that an animal had an innate disposition in the presence of danger to run away as fast as its leg muscles could carry it, it might appear at first sight that it was adequately equipped against this danger, and that the further accompaniment of the emotion of fear (which, in fact sometimes impedes the effective running away), was superfluous or dangerous.

The answer to this question is suggested by the observation that emotions loom into consciousness before the instinctive behaviour with which they are connected begins to be carried out and again when it is in any way impeded.\* During unimpeded instinctive activity, the emotional accompaniment is relatively small. Thus Rivers says<sup>202</sup>: " There seems to be little doubt that fear becomes especially pronounced when there is interference with, or even the prospect of interference with, the process of fleeing, and the possibility cannot be excluded that the normal and unimpeded flight of animals from danger is not accompanied by the emotion of fear."

The fact that emotion tends to well up during interference with behaviour suggests that the biological

\* McDougall denies that it is interference with an activity that produces emotion, and asserts that it is during the carrying out of an instinctive action that emotion occurs, the apparent fading out of emotion in ourselves during unimpeded activity being due to the fact that we are not self-consciously aware of emotion when our minds are given to action.<sup>155</sup> Common observation and the weight of the opinion of other psychologists, however, seem to support the view that interference with activity is the condition in which emotion tends to be greatest.

function of emotion is that of a driving force which leads the organism to adopt varying behaviour to attain some end. Thus anger precedes the behaviour of aggression and, if this behaviour succeeds in its object of injuring the person who roused the anger, the emotion tends to vanish. But if it is found impossible to attain this end, anger persists, leading the angry person to adopt other methods—abusive language, defamatory remarks to other persons, etc.—still directed towards the end of paining or humiliating the person who is the object of the anger.

Similarly, fear may drive us to run away and, while we are successfully keeping ahead of the danger, the emotion of fear becomes small. Then a brick wall impedes our progress, and the emotion again looms up, driving us to adopt other means for saving ourselves from danger—remaining still in concealment or responding with some acquired manipulative behaviour such as turning and firing a rifle. The effect of the emotion is to lead the person experiencing it to adopt varied means to attain an end, while a single invariable line of behaviour such as that of an automatic instinct would only be adequate to secure the end in the particular situation to which the instinct was adapted.

Thus there are two lines of development of behaviour. In such organisms as insects, we see a high development of automatic instincts. The organism is, on the whole, adapted to respond with stereotyped behaviour to accustomed situations. In the other line of development, the organism (partly by the operation of its sympathetic nervous system) develops in response to external situations demanding activity, stresses not towards a particular line of behaviour but towards any kind of behaviour that will fulfil the requirements of the situation. These are the emotions. *Emotions are driving forces serving intelligent variable behaviour just as the automatic instinctive responses serve the needs of stereotyped behaviour.* The disposition to respond

emotionally is itself inborn; it is the result of the inherited organisation of the central nervous system, the sympathetic nervous system, and the organs with which they are associated. We may conclude, then, that the emotional dispositions correspond in the intelligent organism to the automatic instincts in the other line of development. This must be borne in mind when we come to discuss the propriety of talking of human instincts.

## CHAPTER VI

### THE SENTIMENTS, THE ATTITUDES, CHARACTER AND PERSONALITY

#### 1. The Sentiments

When we speak of love, hate, or respect, we are dealing with a different order of mental phenomena from that of the emotions. When we say that a person is angry we mean that he is actually experiencing an emotion with a particular quality of affect and with certain bodily accompaniments. When we say, however, that one man hates another, we are asserting nothing about the particular experience that he is having at the moment; but we are attributing to him an enduring disposition to have certain emotions in certain situations. If A hates B it is possible that he is not thinking about B at the present moment at all, and in that case he is having no experience about B. If he does think of B, his experience is not necessarily of any one affective quality; he would have a variety of different experiences in different situations of B. He would, for example, feel repugnance in B's presence, anger at his good fortune, joy at his misfortune, and so on. The disposition to feel such emotions in such situations of B is A's disposition of hate.

The dispositions of love, hate, respect, etc., have been called "sentiments" by Shand,<sup>213</sup> and this usage has been followed by McDougall and most other British psychologists. Shand describes the sentiments as the greater systems in which the emotions are organised, while McDougall defines a sentiment as an organised system of emotional dispositions centred round the idea of some object.<sup>153</sup>

The formation of a sentiment involves the limitation of an emotional response to some single member or to a small

group of the whole class of objects which can primitively elicit it. Thus it is possible that a male spider is equally attracted to any female spider; in that case, his sexual response is perfectly general to every member of that class. A man's sexual response, on the other hand, may be called out only by a particular woman. We say that he is "in love" with her. His tendency to react is restricted (for the time, at least) to one particular object. Or he may be sexually attracted to a restricted class of women, let us say to all women with red hair.

It is obvious that this kind of specialisation of response takes place at a point of development in the animal scale much lower than that of a human being. Even bees behave differently towards members of their own and of other hives, responding by the behaviour of primitive comradeship towards other bees of their own hive, by pugnacity towards strange bees attempting to enter their hives.

Dogs and cats are also clearly selective in their instinctive responses. It is sometimes said that a dog shows anger if movement is prevented by someone holding its feet. This statement is too general. The dog's response will depend on the person holding him. He may, in fact, show any one of a wide range of responses—pleasure, amusement, boredom, cringing submission, annoyance, or rage. His instinctive responses are specific to particular persons, they are not general responses to a situation.

The actual methods by which generalised responses become specific in their objects are of various kinds. Sometimes the particular objects which become effective in calling out a response owe their preference merely to the fact that they happened to be the objects present when the instinct was first activated.\* This is the case with those instincts which were instanced by William James as transitory instincts that were normally replaced by

\* This fact gives a psychological justification to the Quaker's advice in Tennyson's *Northern Farmer*. "Don't thee marry for money, but go where money is!"

habits.<sup>113</sup> Examples are to be found in the following and avoiding reactions of chicks studied by Spalding.<sup>221</sup>

Young chicks of a few weeks old will generally be found to follow their mothers and to run from any other living creature. It might be supposed, at first sight, that the following instinct was innately specialised to the mother and the instinct of flight to other living things. But Spalding showed that this was not the case. In the first few days of their lives, the chicks showed a generalised instinctive response of running after any moving object. After this time they developed an equally generalised response of running from moving objects. The chicks of a few weeks old ran after the mother and away from other things, simply because the mother was the object presented to them when the generalised "following" instinct was operative. The instinct itself faded away, but the habit of following the mother remained. If some other animal than the mother was present during these first few days the chicks followed that; so families of young chicks were found to form the habit of following a man if he was frequently with them while the following instinct was active.

If no habit of following is formed during these first few days (as often happens with chicks reared in an incubator) it is not formed afterwards and the chicks will fly from their mother as they will from any other strange animal. Such instincts belong to the class which James has called "transitory": the instinct itself disappears and what remains is a habit system which has been formed on the foundation of the instinct.\*

What happens when a human being's innate sex propensity becomes the foundation of a sentiment of love for a particular person (or his innate disposition to anger

\* Let it be noted that James said: "Some instincts are transitory." Some of his critics state James's principle of the transitoriness of instincts in the form: "All instincts are transitory." In this form it is easy to refute, but it is not what James maintained.

becomes the foundation of sentiment of hatred for a particular person or a particular class of persons) is of a somewhat similar nature to the above replacement of a simple instinctive response by a habit. When a man loves a woman, the sentiment for that particular woman has been founded on, and has to a certain extent replaced, his general sexual impulse towards "woman"; he may be said to have formed an emotional habit as the chick has formed a simple bodily habit. But it is certainly not true that the general attraction of woman has disappeared. This residual non-specific element is, however, less strong than it was before the formation of the sentiment. The earlier general sexual tendency has changed but has not disappeared.

Sentiments have been divided into three classes: sentiments for single objects, those for all objects of a certain class, and those for abstract conceptions. These may be called *concrete particular*, *concrete general*, and *abstract* sentiments respectively. For example, love for a particular child, or hatred of a particular cat, would be *concrete particular sentiments*, while love for all children, or hatred of all cats, would be called *concrete general sentiments*. As examples of *abstract sentiments* we may take the love of justice or hatred of cruelty.

Emotional reactions are called out even by abstract sentiments, but less strongly than by the concrete sentiments. It is easier to love a child strongly than to love justice. Since, however, many of the sentiments of social importance are of the nature of abstract sentiments, it is important that the emotional reactions of these should be made as strong as possible. This is often done by providing a concrete nucleus round which an abstract sentiment can gather. The national flag and King provide such nuclei for the abstract sentiment of patriotism; and, as a result, this sentiment may take such a form as to suggest to the careless observer that it is a concrete particular sentiment for this nucleus. Similar nuclei often serve a similar

purpose in the religious sentiment. A sacred book, a cross, a totem, or an image may be the concrete object which suffices to call out the emotions of the religious sentiment. The reason for the existence of these foci is the difficulty with which strong emotional reactions are produced by purely abstract sentiments.

Every sentiment undergoes a process of development and organisation throughout its period of existence. A sentiment of hate, for example, normally becomes strengthened when we indulge in the revengeful behaviour dictated by it, and weakened and disorganised by persistent refusal to allow ourselves this behaviour and the emotions associated with it.\* These changes in any sentiment may also react on the rest of the character.

Shand sums up these principles of the development of the sentiments and their reaction on the rest of the character in his *Law of Organisation of the Sentiments*. This law states that: "Every sentiment tends to include in its system all the emotions, thoughts, volitional processes and qualities of character which are of advantage to it for the attainment of its ends, and to reject all such constituents as are either superfluous or antagonistic"; every growing

\* Although common observation would lead us to suppose that this statement is true (and of great practical importance since it suggests the method of voluntary control of sentiment development), it seems to come into conflict with the psychoanalytical principle of "repression" developed by Freud and his followers which suggests that the suppression of the behaviour outlet of an emotional disposition may cause it to become "unconscious" but to influence behaviour with undiminished vigour, often in unexpected ways.<sup>83</sup> There is good reason for supposing that this is also a true statement of what may happen. No experimental enquiry has yet enabled us to say under what conditions weakening of a sentiment follows suppression of the behaviour dictated by it and under what conditions Freudian repression takes place. Almost certainly repression occurs most readily in persons of a certain mental constitution—the "hysterical" personalities, i.e., those with a tendency to mental dissociation. Probably also the typical cases of repression are those in which the emotional disposition in question has already been strengthened by free indulgence in its behaviour before this has been suppressed.



sentiment tends to work towards its own more efficient organisation by rejecting what it does not need, and acquiring what it does, and by this fundamental law its advance is governed. (*E.g.* men who love themselves tend to grow hard-hearted because the tender emotions have no function in self-love and atrophy from want of exercise.)<sup>213</sup>

## 2. Sentimentalism

The sentimentalist is the person whose sentiments appear to be strong and numerous but do not lead to effective action. William James considered that the source of sentimentalism was the indulgence of the emotions for their own sake instead of allowing them to take their place in the mind as movers to action. He considered that every indulgence of feeling which did not lead to its own proper action was increasing sentimentalism. Stage representations and the reading of novels might, he said, have this effect, for in them the emotions were indulged with no outlet in action—pity, for example, was aroused without leading to action for the relief of distress.<sup>115</sup>

McDougall describes the sentimentalist as the person who forms sentiments about sentiments.<sup>155</sup> This is more limited but not otherwise essentially a different conception from that of James, for the forming of sentiments about sentiments is a very effective way of escaping the demands of action. There were during the war those who loved their country and those who loved patriotism. The latter were the patriotic sentimentalists. They indulged in a great deal of emotion, but it did not lead to courageous or self-sacrificing action. One may die for one's country, but one need not die for the sentiment of patriotism. So the sentiment of patriotism is the safer object of devotion for the sentimentalist. The person who forms sentiments about sentiments is, however, only one kind of sentimentalist.

## 3. Attitudes

Although the word "sentiment" has not been universally adopted by writers in psychology, all modern psychologists have realised the necessity for some term to indicate those dispositions which determine the consistency

of reactions towards certain objects and classes of objects. Amongst American psychologists the term "attitude" has been very generally adopted. A discussion of the use of this term and of the investigations connected with it is to be found in an article by G. W. Allport in the *Handbook of Social Psychology*.<sup>6</sup>

The word "attitude" has sometimes been used in a sense indistinguishable from that of "sentiment." Thus Thomas and Znaniecki define an attitude as a "state of mind of the individual towards a value," and give as examples: love of money, desire for fame, hatred of foreigners, and respect for a scientific doctrine.<sup>6</sup> These would, of course, be called "sentiments" by Shand and McDougall.

Usually, however, the term has been used more widely. It includes not only sentiments but also interests and such general ways of reacting as tolerance, or radicalism, or scepticism. These general ways of reacting have no definite object or group of objects towards which they are directed, so that they could not be classed as sentiments. Laziness and severity for example, are attitudes but they are not sentiments. Anti-semitism, patriotism, and love for a particular person, on the other hand, are both sentiments and attitudes.

The usage of the term is, however, very commonly still wider than this. Many years ago experimental psychologists discovered that the results of laboratory measurements were dependent on the subject's state of mind at the moment as determined by such factors as the instructions given to him, his own understanding of the task to be performed and his readiness to perform it. Thus if a subject is told to look out for a light and press a key as soon as he sees it, he takes a longer time to react than if he had been instructed to be ready to press a key and to do it when he saw the light. He has two different states of preparedness for action, one in which he is looking out for a light and the other in which he is keeping himself

ready to press a key, and these two states give measurably different results. Various names were given to these states of preparedness to react: in German *aufgabe*, in English "set" or "attitude."

The word "attitude," as used in this sense, has obviously some relation to the use described earlier. In both cases it is something in the subject which determines his reactions although in the one case it is a transitory condition determined by the subject's present situation and intentions which will in a short time be different, whereas in the other it is a lasting disposition due to the cumulative effect of social and other influences over perhaps a long period of years.

McDougall has criticised the conception of "attitude" on the ground that it is used to cover such a multitude of facts of different kinds that it is of little or no value as an aid to knowledge.<sup>158</sup> On the other hand, the conception of sentiment has sometimes been criticised as too narrow to cover all the kinds of disposition that it is necessary to study. If "sentiment" and "attitude" were used in the same way it would, of course, be of no importance which term we used. The difference would have no significance except as a psychologist's "group distinguishing mark." Since, however, "attitude" is generally used to cover a wider class of facts than "sentiment," there seems to be good reason for employing both terms. We need in psychology, as in all sciences, both wide and narrow class terms. Zoologists do not dispute about whether a rat is a rodent or a mammal. "Mammal" is a wide class term in which the smaller class of "rodent" is included. So also we may use "attitude" as a wide class term which includes the smaller class of "sentiment."

On the other hand, the usefulness of a class term depends partly on it not being used so widely as to include items which are insufficiently related. There seems no reason for using the one word "attitude" to include such transitory determinants of reactions as the "aufgabe."

For these it seems better to use the term "mental set." \* An attitude is not, of course, altogether permanent; it may be modified by any experience in which it is operative or may be completely changed. It is, however, relatively permanent when compared with the mental set whose essential nature is that of being determined by the particular situation, set of instructions, or deliberately adopted intention which have called it out. Of the many definitions of "attitude" quoted by Allport, we may select that of Cantril as best expressing this meaning: "*. . . a more or less permanently enduring state of readiness of mental organization which predisposes an individual to react in a characteristic way to any object or situation with which it is related.*"\*

One of the reasons for the increase of interest in attitudes rather than in sentiments during the last few years is the large amount of experimental investigations to which this conception of attitudes has given rise. Many of these investigations might equally well have been carried out if the dispositions in question had been called "sentiments," but it was under the name of "attitudes" that the enquiries were in fact made. While some of this experimental investigation has probably little significance, a number of questions of considerable interest and importance have been investigated. By asking a number of subjects a series of questions about their political or religious opinions, their feelings about other races, etc., it is possible to obtain a picture of each individual's attitude on these questions. It is found that the answers of each individual on independent items in any one of these topics have a considerable measure of self-consistency, which shows that there is a general attitude determining

\* There is, of course, no reason why a psychologist should not use the word "attitude" for what we here call "mental set." Many have done so. If he does, however, he should not also use the same word for the enduring dispositions that we are here calling "attitudes."

the individual's reactions to any one system of possible situations. Such attitude measures have a certain resemblance to intelligence tests, but differ from them in that what is determined is not an ability, and that it is not inborn but produced by the circumstances of the individual's social life.

#### 4. The Temperaments

The differences between the characters of different individuals are partly the result of the different attitudes and sentiments which have been produced by the action of their social environment, and partly by differences between their systems of emotional dispositions. There is a certain consistency in the emotional reactions of any individual, one shows long and lasting loves and hates, another may show much emotion in expression but show no constancy in the objects which call out his feelings. It is this general character of a man's emotional reactions that is called his *temperament*. Temperamental differences are probably partly innate and partly acquired; determined in part by a man's inborn physiological constitution (*e.g.* by such factors as the innate balance of his endocrine secretions), but also to some extent by the influence of social and other environmental factors which may affect his temperament by changing the activity of his sympathetic nervous system, or the activity of his endocrine glands, or in some other way.

Descriptions of the different temperaments have been current since the time of Hippocrates who distinguished four temperaments, each determined by the presence in the blood of an excess of one of four "humours." Descriptions of these have varied in different writers but the main characteristics have been much the same. The *sanguine* temperament is characterised by superficiality of emotion and inconstancy; the *bilious* temperament is one which shows depth and stability of emotion and inflexibility of

purpose; the *nervous* temperament is characterised by rapidity of thought and movements, while the *phlegmatic* temperament is accompanied by slowness of thought and movement.

The classical description of the temperaments is, no doubt, a fruit of acute observation which makes distinctions which can still be recognised as having a certain amount of validity. No scientific method of temperament testing has, however, been devised which has the result of dividing men by their temperaments into these four classes, nor has it been proved that the characteristics which they describe are general for all emotional responses. If the same man, for example, can show superficiality in love but depth and stability in scientific investigation, whether he will be described as of sanguine or of bilious temperament will depend on which sentiment the observer is the more interested in.

It is in abnormal mental conditions, however, that one can see the classical temperaments most clearly distinguishable. Mania and melancholia, for example, are conditions of extreme nervous and extreme phlegmatic temperaments respectively. Similarly, excessive secretion of the thyroid gland produces an extreme excitation of the emotional system which corresponds to some extent with the classical description of the sanguine temperament. It is possible that the classical temperaments are descriptions of the effects on character of different conditions of secretion of the endocrine gland system.\* If this is the case, the further

\* It must, however, be remembered that we have not yet any grounds for saying that all individual differences are due to differences in the endocrine secretions, and still less for pretending that we know what are the endocrine differences determining differences in temperament. The little that is known about the exact relation of human conduct to the activity of the endocrine glands can be richly elaborated by anyone with a fertile imagination. A medical writer says, for example: "The variations between animals of the same species are due to the ductless glands. Race characteristics are produced and perpetuated by the same factors, and the differences among individuals of the same race

distinction and refinement of the idea of temperamental types may prove to be a task for the physiologist, not for the psychologist.

## 5. Character

A man's *character* is the integrated whole of his mental dispositions.\* Like all words describing dispositions, "character" is not the name of something we can directly observe. The directly observable thing is a man's behaviour (if we use "behaviour" in a very wide sense to include glandular and visceral responses as well as the movements of the large muscles). If there were no uniformities observable in the behaviour of a single individual at different times, or if such uniformities were entirely determined by similarities in the outside circumstances affecting the individual, we should not speak of his *character*. It is because the behaviour of a human being is to a certain extent predictable, and because it is not predictable entirely in terms of the environment, that we postulate enduring mental dispositions and give the name *character* to the whole system of those dispositions.

An individual's character is obviously determined in part by his inborn bodily and mental qualities and partly by the circumstances of his life—his education, the demands of his occupation, and so on. It is sometimes

likewise depend on endocrine activity, and resemblances in body, mind or psyche, whether the resemblance is that of normality or abnormality, are due to like or similar relations in the activities of the endocrines"<sup>16</sup> It is necessary when we read a passage like this to remind ourselves that it is prophecy and not a report of the results of scientific research. Its basis is assured knowledge of the relationship between mental phenomena and the activity of the endocrine organs is very slight.

\* The word "personality" is very generally used in America for this purpose. An American "personality inventory," for example, would be called in Great Britain a "character inventory," the word "personality" having in this country metaphysical implications absent from "character."

said that temperament is the innate part of character. If, however, temperament is defined as the general character of the emotional dispositions, this is only partly true since this general character of emotional dispositions is itself partly determined by environment. If, for example, an individual lives in a social environment in which uninhibited expression of joy, anger and sorrow is the approved type of response, his temperament will tend to be of the type showing free expression of emotion.

The separately measurable parts of character are very commonly called *traits*. The scientific assessment of an individual's character is generally made by the test measurement of a large number of traits: such as suggestibility, introversion, affectivity, etc.\* There is plainly no way in which, from separate measurements of traits, a single figure representing character can be derived. The result of such an assessment is, therefore, usually represented by a diagram in which the amount of each trait is represented separately by a height above a base line, and these points are joined by a line. The shape of the line indicates the character of the individual concerned to anyone who understands the principle on which the diagram has been constructed. Such a diagram is called a *psychogram*.

A psychogram must, of course, be an incomplete representation of character since at best it can only represent a sample of the traits of the individual concerned. Moreover, character is not a mere sum of traits but a whole with properties of its own which are not the properties of its parts. Character can no more adequately be represented as a sum of traits than perception can be represented as a sum of sensations. For this reason, many psychologists prefer to assess character by judgments of it as a whole rather than by measurement of separate character traits.

\* See pp. 111, and 807, respectively.



## 6. Types of Character

There have been very numerous attempts since the Hippocratic classification of temperaments to distinguish types of character. Most of these have been based on general impression rather than on scientific analysis of resemblances. Although each writer uses his own nomenclature and his own principles of division, there is a manifest tendency to make divisions along similar or parallel lines. These typologies are so numerous that a whole book might be devoted to their discussion. A few only can be mentioned here.

William James divided mankind into the "tough-minded" (scientific and practical) and the "tender-minded" (metaphysical and theoretical).<sup>114</sup> E. R. Jaensch, starting from the study of eidetic imagery, distinguished two main types of character<sup>115</sup>: the T-type whose facial expression and character formation resembles that found in the disease of tetany, and the B-type with the same relation to exophthalmic goitre (Basedow's disease). Later a more general division into "disintegrate" and "integrate" types was proposed which included the T- and the B-types respectively as special cases.

With a more solid basis in scientific research is Kretschmer's system of typology.<sup>116</sup> As a result of observing the correlations between different physical measurements he divides men into three physical types; the *athletic* (large muscle and bones), the *asthenic* or *leptosomatic* (lean, flat chested, and narrow shouldered), and the *pyknic* (with tendency to rounded contours of face and body). He found that there was an almost invariable association between the type of disorder of the insane and their physical type. If persons of the athletic or asthenic physical types became mentally deranged they developed a disorder of the *schizophrenic* group (such as dementia praecox, paranoia or delusional insanity, and paraphrenia). In all of these disorders, the patient seems to be more or

less detached from ordinary social influences and to be shut in with a world of ideas of his own. Persons of the pyknic physical type, on the other hand, if they become mentally deranged, develop the *cyclophrenic* disorder of manic-depressive insanity. In this form of insanity, the patient shows typically alternation between the expansive emotional excitement of mania with a rapid flow of ideas, and the slow, depressed condition of melancholia.

Kretschmer's contribution to character typology is his observation that normal persons of the asthenic and athletic type tend to have in a mild degree the temperaments and character traits which exist in an exaggerated form in the schizophrenic; they tend to be shut-in, relatively unsociable, and self-centred. These he calls the *schizothymic* type. Normal pyknics, on the other hand, tend to show in a less extreme form the alternation of mood of the cyclophrenic, being generally genial and happy, but suffering from periods of painful depression during which they may feel an impulse to suicide. These are of the *cyclothymic* character type.\*

These correlations of character type with physical make-up are deeply grounded in popular belief. We expect the round-faced man to be hearty and friendly, and the dreamers as well as the self-centred and ambitious are commonly represented as of the hatchet-faced physical type. Thus, we have the well-known passage in *Julius Caesar*:

"Let me have men about me that are fat;  
Sleek-headed men, and such as sleep o' nights;  
Yond' Cassius hath a lean and hungry look;  
He thinks too much: such men are dangerous."

\* Kretschmer also uses the terms "schizoid" and "cycloid" for those who show these character formations in an extreme form, although not sufficiently so to be mentally deranged. Some of these have been men of outstanding ability as Robespierre and Mayer (the discoverer of the principle of conservation of energy) amongst schizoids, and Beethoven and Ruskin amongst cycloids.

In Kretschmer's terminology: "Let me be surrounded by pyknics. Cassius is of asthenic physical type, and, therefore, of schizothymic character, possibly paranoid."

Jung's distinction of *extrovert* and *introvert* is based not so much on a distinction between general emotional dispositions (*i.e.* temperaments) as on temperamentally determined attitudes.<sup>121</sup> The introvert is the person to whom phantasy is more important than reality, who tends to adapt himself by thought construction rather than action, who becomes a philosopher rather than a scientist. The extrovert, on the other hand, is more concerned with external reality than with phantasy, adapts himself by feeling rather than thought, acts on the environment instead of phantasying, and tends to have scientific rather than metaphysical interests. The extreme case of introversion is the person suffering from *dementia praecox*, who lives entirely in a world of phantasy and has lost contact with the real world; while the extreme case of extroversion is the *hysteric*.

There are certain complications which Jung has found necessary to introduce into his conception of introversion and extroversion. In his earliest work on the subject, Jung said that one might be consciously extroverted but unconsciously introverted, so that traits of character belonging to the two attitudes in the same person could both be explained on the introvert and extrovert theory. Later, he has introduced a further complication by subdividing both introvert and extrovert types into four sub-classes in which adaptation is found by thinking, feeling, sensation and intuition respectively.<sup>122</sup> Jaensch and Kretschmer also have subdivisions of their two main character types.<sup>123 124</sup>

We may notice that, although all of these writers use different criteria for making their division, the dividing line runs in approximately the same position for all of them. "Tender-minded," "disintegrate," "schizothymic" and "introverted" are categories which include, on the whole the same individuals. Similarly for

"tough-minded," "integrate," "cyclothymic," and "extroverted." Indeed many other writers have made the same two-fold division and applied different names to the two classes which result. Independent enquiry has provided more terms than the facts require, and it is to be hoped that no future character typologist will increase the confusion by performing again the same dichotomy with new terminology. It is necessary to decide which of the terms available we shall use. Two have become firmly embedded in psychological literature: Kretschmer's and Jung's. It is, therefore, convenient to retain both, using the terms "schizothyme" and "cyclothyme" when we are thinking of the temperamental differences, and "introvert" and "extrovert" when we are thinking also of the associated differences in attitude towards reality and phantasy.

## 7. Personality

The character is the general distinguishing feature of the whole system of the more or less completely integrated body of tendencies, experiences, etc., which we may call the *personality*. There is very wide divergence in the meanings which have been attached by different writers to the word "personality." Most commonly it is used in the above sense: for the complete organisation of mental life in the one individual. A man's "character" is then the kind of personality he has; if A and B have the same kind of personality, we may say that their characters are the same, but not that their personalities are the same (for that would mean that A and B were the same individuals). It is in this sense that personality is generally used by philosophers and amongst psychologists in such phrases as "dissociation of personality." The word "personality" is also used, however (as has been mentioned) in the sense in which we are using "character." It has also been used for the effect upon another of one's appearance, behaviour,

etc.<sup>183</sup> We certainly need a word for this, but "personality" does not seem to be a suitable one.

The words "personality," "character," "Ego" and "self," have been used by different writers to cover the whole, or part, or some aspect of what we are here calling "personality." We may remind ourselves that it is not important to decide what is the "right" use of a word, although it is advisable to be aware of diversity of usage so that we may not misunderstand a word when it turns up with an unaccustomed meaning. We have already decided the meanings which we shall give to the words "character" and "personality." The word "Ego" may be applied to a particular organisation within personality; a man's Ego is that unified part of his personality to which, in ordinary speech, he applies the word "I."

Primarily the Ego is something distinguished from a world of external objects and from other personalities. It is also, however, distinguished from elements of personality which do not belong to its own more restricted unity. An impulse may, for example, be experienced as coming from within or outside the system of the Ego. When we say, for example, "I felt an impulse to run away but I resisted it," the impulse is experienced as something outside and opposed to the system of the Ego. The whole range of personality outside the Ego is called by Freud the "id," and is regarded by him as the source of dreams, of neurotic symptoms, etc.

Let us not suppose that in using such words as "personality" and "Ego" we are departing from scientific psychology and adventuring in metaphysics. There has certainly been much metaphysical speculation about such things, but they stand also for conceptions which have effects on behaviour and experience which a scientific psychology cannot afford to ignore. The stresses which exist between the Ego and the external world are determinants of behaviour, and behaviour cannot be explained if we treat it simply as matter of an external world

on the one hand and an unorganised system of impulses on the other. Differences in the degree of integration of personality, moreover, produce observable and important differences of behaviour. Extreme lack of integration may produce even such pathological symptoms as the multiple personality which we shall discuss later.

The kind of personality that an individual has (*i.e.* his character) affects not only his behaviour but also the behaviour of other people towards him and their impression of him. Indeed a part of his personality will be determined by the social necessity of presenting a desirable appearance to other people. His personality may contain hesitations and fears which he does not wish other people to see, so he may adopt a social behaviour which suggests to others the characteristics of determination and inflexibility. This set of behaviour characteristics adopted for social purposes we may call (following Jung<sup>121</sup>) by the name of the mask worn by Roman actors, the *persona*. The analogy of the mask should not mislead us into thinking the persona a mere disguise and not a true part of the character of the person adopting it. At first it may be only a disguise but later it may become a genuine habit system or social attitude, although it may play the part of a mask in hiding from others the underlying weakness which is also a true part of the individual's character.

Thus the personality as it appears to others is not the same as the personality in itself. The persona or masking social attitude has a predominant effect in determining how the personality shall appear to the outside world (although less, of course to intimates). Bismarck, whose persona of hardness made him appear a man of iron to the outside world, was referred to by his wife, who had experienced the part of the personality behind the persona, as "a poor, sick duck."<sup>125</sup>

Generally the personality as it appears to others is different for different observers (as are the shapes and colours of the outside world to different perceivers). In

perception we find it necessary to distinguish between the "real" object and the "phenomenal" object for each observer;\* so we may distinguish between a man's real personality and the "phenomenal personality" as it exists for his wife, for one of his employees, for his next door neighbour, or for his dog. The word "self" is, I think, best used for the phenomenal Ego as it exists for the man himself.

### 8. Dissociation of Personality

Janet first pointed out that the various symptoms of hysteria—anaesthesias, imaginative production of symptoms of illness, insufficiency for life's tasks, somnambulisms, etc.—might be attributed to a splitting up of personality whereby some part of mental life was taking place without the usual control by an inner sense of belonging to the Ego.<sup>117</sup> To such splitting up of personality the name *dissociation* has been applied.

Its most extreme form is "multiple personality" which is found in some hysterical patients. In multiple personality there seem to be, controlling the same body, two or more personalities, each with different memories, a different character, and different thoughts. These different personalities may be in control of the body at different times, but there is also evidence that one personality may continue to have an independent train of thought, while another personality is in control of the body.

The best known example of multiple personality is Morton Prince's patient, Miss Beauchamp, who came to him suffering from well-marked hysterical symptoms.<sup>117</sup> She developed during his course of treatment by hypnotic suggestion, two personalities which he called B I and B IV, which alternated spontaneously, and a third mischievous personality whom he called "Sally," who sometimes had control of the body when B I and B IV were

\* See p. 233.

"absent," but also seemed to go on existing co-consciously when either of these was in possession. B I and B IV were parts only of the complete personality of Miss Beauchamp which had been split up at a certain stage of her life. Each was incomplete. B I was inhibited, scrupulous and unhappy. B IV, on the other hand, showed good health, but was egoistical and lacking in social and altruistic feelings. Neither of them had any memories in common, except those of the period of Miss Beauchamp's life before the splitting took place. The original personality of Miss Beauchamp was got back by a combination of B I and B IV, and a personality was then obtained possessing elements of character which each dissociated personality lacked, and possessing the memories of both B I and B IV.

We only apply the name "multiple personality" to those cases of dissociation in which the dissociated part is itself so well organised that it would be recognised as a personality by another person. There are lesser degrees of dissociation; in "fugues" or wandering states the amount of organisation of the dissociated part is less than in multiple personality, and still less in "somnambulisms." A person suffering from a fugue commonly lives like a tramp, sleeping out-doors, whereas a typical somnambulist walking outside would certainly be taken in charge by a policeman as showing such abnormal disability that he could not take care of himself. Both Miss Beauchamps, on the other hand, were able to earn a living and probably did not seem strikingly abnormal to acquaintances.

True multiple personality apparently sometimes occurs spontaneously (as Ansell Bourne, whose case is reported by William James<sup>118</sup>) but it has been much more commonly produced accidentally as a result of hypnotic treatment. This was probably the case with Miss Beauchamp. This does not diminish the interest of these cases for a theory of personality, although it much reduces their practical importance.



In the early days of the investigation of hypnotism, it was supposed that every one of us had a "subconscious personality" in addition to the personality of his ordinary waking consciousness. There is no reason for believing that this fantastic supposition is true. We all have, no doubt, part of our mental organisation which is more or less independent of the Ego. We may extend the meaning of the term "dissociation" to this normal independence from the Ego of part of the personality. Freud attributes such independence to the active "repression" of mental systems painful to the Ego or incompatible with its standards. Thus psychoneurotic disturbance is regarded as an extreme manifestation of processes of dissociation occurring in us all.

Miss Beauchamp, even before treatment, showed complete amnesia of an incident connected with her sexual life which occurred immediately before her illness, and her character formation at that time suggests abnormal dissociation of the impulses connected with sexuality. She was not yet, however, a multiple personality. It was when, under hypnotic treatment, the dissociated part of her personality was able to function independently that it became organised in such a way as to have the character of a separate personality. For normal persons and most hysterics, such independent organisation of dissociated elements of personality never takes place. They may be said to have subconscious mental processes but no subconscious personalities.

Phenomena of mental dissociation have a certain social importance since in some communities the mentally dissociated are highly valued, while in others they are persecuted. The Shamanism of the Eskimos, American Indians, and other peoples, for example, is a priesthood of those who have visions and trances, both accompaniments of dissociation. Diabolical possession is also probably a phenomenon of dissociation. The mischievous Sally appeared like a demon to Miss Beauchamp (B I), and in

an earlier age, Miss Beauchamp would have attributed her troubles to possession by a devil. This may explain why many of the tests for witches in the Middle Ages (such as the test for anæsthetic patches of skin by pushing in pins) were what we should now regard as indicators of hysteria.

## CHAPTER VII

### THE FOUNDATIONS OF HUMAN BEHAVIOUR

#### 1. The Problem of Human Instincts

The question of how far the conception of instinct can legitimately be used as a principle for the explanation of human behaviour is one about which there is not complete agreement amongst psychologists. Difference of opinion is to be expected on a problem which can at present not be submitted to the test of experiment, although it might have been hoped that competent and unprejudiced scientific observers would have gathered from the observation of the same facts opinions less divergent than those we find in current psychological literature.

The divergence of opinion, though real, is considerably less than appears at first sight, since differences of statement are often due more to differences in the use of the word "instinct," than to differences in interpretation of the facts. When we read, for example, that James<sup>113</sup> and McDougall<sup>183</sup> say that man has many instincts while J. B. Watson says that man has only a few instincts but a large number of tendencies to form habits,<sup>268</sup> these statements appear at first sight to be in direct contradiction. When, however, we realise that Watson attaches a different meaning to the word "instinct" from that adopted by James and McDougall, and that their meaning of instinct may be the same as his "tendency to form habits," we are no longer certain that the two statements are not simply different ways of saying the same thing. Until we have distinguished between the verbal and the factual parts of the dispute about instincts, we cannot know what is

the real difference in opinion about the nature of the forces behind human behaviour.

We may first notice a few essential facts about which there is complete agreement. In an earlier chapter, examples of instinct were drawn mainly from such organisms as insects, low in the scale of behaviour variability. These show patterns of behaviour which vary little either in the situations calling them out or in the nature of the responses themselves. Both the effective situation and the response are almost entirely determined by the inherited make-up of the organism and are little influenced by learning. If we restrict the word "instinct" to such automatic behaviour responses there can be no doubt that instincts are not found in man. About this fact, there is no difference of opinion whatever amongst psychologists.

On the other hand few (if any) psychologists would consider that on its behaviour side, the human organism is to be regarded as originally indifferent to the behaviour patterns imposed on it. The young baby shows unquestionably innate propensities to crawl, to suck, to babble, etc. He also inherits physical structures which limit his behaviour propensities in some directions and enrich them in others. His mobile and prehensile hands lead to his acquirement of manipulatory behaviour; the structure of his laryngeal organs gives him a capacity for acquiring language which is denied to the ape.

The young baby also shows the withdrawal impulses we associate with fear and the aggressive impulses that, in the adult, accompany anger. There is, therefore, an original or inborn element in his emotional responses, although it will not be his inborn nature but the particular events of his life that will later determine what things he is afraid of, and what things make him angry. Even those emotional responses which are not found in early childhood, such as those of genital sexuality and maternal tenderness, undoubtedly have an inborn driving

force although in man (but not in many other animals) the details of the behaviour they lead to are mainly acquired.

There is thus no difference of opinion as to whether human behaviour is partly determined by factors that are inborn. Some (like J. B. Watson) would restrict the word "instinct" to such inborn responses as crawling, babbling, etc. If we use the word "instinct" in this way, no psychologist would dispute the statement that human instincts are few and are unimportant as determinants of adult behaviour. On the other hand, those who assert that human instincts are numerous and important do not use the word "instinct" in this way. They may call such responses "innate motor mechanisms" while the word "instinct" is differently applied.

Before deciding whether a writer's statement about instincts is true or untrue it is as necessary to be clear whether it is this or some other meaning that he is attaching to the word "instinct," as it is to be clear in what language he is writing. A true statement in French would still be true if translated into German. So also a true statement about human behaviour made with one use of the word "instinct" would still be true (in a different form) if the same statement of fact were made with the word "instinct" used in another way.

The other common use of the word "instinct" is that adopted by William James and clarified and systematised by McDougall in which the driving forces behind such behaviour as escaping, mating, constructing, etc., are called "instincts" although these may use different motor mechanisms and with no implication that the motor mechanisms that they use are innate. This use does imply, however, that the driving forces themselves are inborn, and this is a question of fact about which there is ground for dispute. We have already seen that the emotional dispositions of fear, sex-love, etc., correspond in the intelligent organism to the automatic instincts in the other line

of evolutionary development.\* Thus there is some ground for calling these dispositions in the intelligent organism its "instincts" even though they may not discharge into any stereotyped lines of behaviour. Before considering the objections to this usage, it would be well to describe McDougall's conception of human instincts (or propensities).

## 2. McDougall's Classification of Innate Human Behaviour Tendencies

In his *Outline of Psychology*, McDougall distinguished fourteen human instincts, each of which showed one particular kind of goal-seeking behaviour and was accompanied by one characteristic primary emotion. Later he abandoned the use of the word "instinct" for this purpose, and substituted "propensity" for the driving force behind such innate behaviour tendencies, using "instinct" only for the combination of a single propensity with a single system of innate abilities (as is found in the lower animals but not in man).

In *The Energies of Men*, McDougall gives the following tentative list of human propensities: (1) food-seeking propensity, (2) disgust, (3) sex, (4) fear, (5) curiosity, (6) protective or parental, (7) gregarious, (8) self-assertive, (9) submissive, (10) anger, (11) appeal, (12) constructive, (13) acquisitive, (14) laughter, (15) comfort, (16) rest or sleep, (17) migratory, (18) a group of very simple propensities subserving bodily needs, such as coughing, sneezing, breathing, evacuation.

McDougall does not regard this as a final list and suggests that under some of these headings more than one propensity may be included (No. 13, for example, may include two propensities, one to acquire and one to hoard) and that some (such as 17) may not be true human

\* See p. 94.

propensities. "But," he concludes, "in spite of these uncertainties and of differences of opinion among authorities, which require us to regard this list as subject to revision, there is no room for doubt that such inborn propensities are the very foundation of all our mental life, that they provide the driving forces, the hormic energies, manifested in all our activities from the simplest to the most complex."<sup>158</sup>

Since most of the controversy about human instincts has centred round McDougall's treatment of them, it is necessary to be clear as to how far *The Energies of Men* shows a real change of opinion on the subject. First, we notice that McDougall has changed his use of the word "instinct." Many of the critics of his earlier treatment misunderstood his previous use of the word and supposed that he was affirming that men inherited specific responses to specific stimuli. This was, in fact, denied by McDougall as it was by his opponents. On the other hand, it is clear that the word "propensity" is used in the same sense as "instinct" was used in the earlier books. There is no change in McDougall's opinions but only in his use of words. Those who have objected, therefore, to his earlier treatment of the subject not on verbal grounds but because they considered that he over-estimated the inherited determinants of human behaviour systems must still be in disagreement with him.

### 3. Criticisms of Theories of Human Instincts or Propensities

An obvious objection to the use of the term "instinct" in describing human behaviour is that it is likely to lead to misunderstanding. In the popular use of the word "instinct," the idea of fixity of behaviour is certainly implied. If psychologists speak of human instincts, they will generally be thought to be lending support to a view that human behaviour is more fixed and invariable than it really is. Examples of popular thinking on instincts are

to be found in such arguments as the following: "There must always be war because man is born with an instinct of pugnacity," "Competitive individualism is the only possible enduring structure of society because man has an instinct of acquisition."

It is true that the psychologist may define instinct in such a way that it does not imply stereotyped response (and etymologically there is no reason why it should have that implication), but he will not be generally understood by those who do not critically examine the uses of words. It is better that he should be understood, so it is wiser to avoid the word "instinct" if another word can be found.

This objection (of some practical but no theoretical importance) is overcome by McDougall's adoption of the word "propensity." It must be admitted that, defining "propensity" as he does, McDougall is right in asserting that human beings have propensities. There remain many questions open to dispute.

We may not agree with his list of propensities. Since, however, there seems to be no scientific way of settling what is a separate propensity so that the way of separating them must be decided by an appeal to authorities, this is a problem which could only lead us into verbal disputes and it may be left on one side.

More serious are the questions of the importance of the description of the propensities, and of the truth of the statement that they alone provide the driving forces of all our activities. Description of the propensities would be of fundamental importance to social psychology if the differences between societies could be shown to be dependent on the differences between the propensities of their members. For this dependence, there is little or no evidence. Societies differ enormously in the nature of the dominant incentives to which their members respond, people of one culture may be aggressive while a neighbouring people are peaceful and friendly, in one district



they may be individually acquisitive while in another they are relatively communistic. Anthropologists and sociologists are, however, convinced that these variations are due to differences in the cultural histories and acquired social attitudes of the peoples concerned and not to differences in their innate equipment of propensities. That this is very commonly true is suggested strongly by the observation that a peaceful people may in a few generations be changed into a warlike one (as the Fijians<sup>186</sup>) or a warlike people into a peaceful one (as the Maoris and Red Indians) by change of cultural conditions. Similarly the acquisitive pattern of culture may be imposed on a primitive people by contact with capitalist civilisation. Innate propensities cannot change so quickly, and we must suppose that, with the same propensities, different social behaviour patterns are adopted as one or another propensity is reinforced or inhibited by social custom. If this is true, it means that while human propensities may exist, they do not throw any light on social history comparable with the light thrown by the study of the action of such social forces as cultural patterns, social institutions, etc.

It may be objected that, at least, we know that some primitive societies are more resistant to change than others and that this may be explained by their propensities being not those required by the pattern of culture with which they are presented. In Kenya, for example, the Kikuyu seem ready to adopt our own acquisitive pattern of culture, producing goods for sale and buying commodities with the money received, whereas the Masai seem indifferent to this system of incentives. This might be explained by supposing that the Masai were abnormally lacking in the acquisitive propensity. There may, however, be other explanations. It may be that the social traditions of the Masai are such that the attitudes acquired from early childhood make them resistant to our civilisation and to its recognised incentives. Until we have an

independent method of measuring the innate factor in acquisitive behaviour, explanation in terms of an acquisitive propensity is merely speculative.

The same difficulty occurs in the explanation of the differences between individuals by the differences in their propensities. We know that some individuals are more aggressive than others and that some are more acquisitive. But are these differences in their propensities? They may be differences in attitudes, acquired perhaps in early childhood. Freud attributes to the experiences of early childhood many of the differences between individuals that others would attribute to instincts or propensities, and there is no scientific way of deciding between these possibilities.

The difficulty that there is no valid way of deciding what human behaviour tendencies are innate and to what extent, is a fundamental objection to any attempt to base human psychology on innate propensities. Is, for example, McDougall's "constructive propensity" really an innate tendency, or is it an acquired behaviour system resulting from the fact that the child finds himself surrounded by tools and other instruments and learns to use them? Is acquisitiveness an innate propensity? There are parallels to human acquisitiveness in the animal kingdom but they are rare and mostly to be found in animals not closely related to man. Few would doubt that there is an innate propensity behind sexual behaviour, but how many of the actual facts of sex behaviour are due to this innate foundation, and how far is the persistence of sex behaviour in a particular person determined by the strength of this inborn factor? There seems to be no way in which these questions can be decided.

The difficulty arises from the fact that the words "instinct" and "propensity" necessarily imply something inborn. In the use which we are discussing at present, it is not implied that the behaviour pattern itself is inborn but that the motive force or energy behind certain

lines of behaviour is inborn. It may reasonably be doubted whether there is any inborn motive force driving men to construct things or to acquire objects in excess of their immediate requirements, but there are others of McDougall's propensities in which the existence of an inborn motive force will not be questioned, as, for example, the sex propensity and the fear propensity. We still do not know how far the energy behind these kinds of behaviour is inborn. If a man is unusually timid it might be because he was born with an unusually strong fear propensity, or because he was frightened when young, or because he has developed an anxiety neurosis as a result of a sexual repression, or for some other reason connected with the particular circumstances of his life.

We may get over this difficulty verbally by defining a "propensity" as that part which is innate of the energy behind some human behaviour tendency. This is, however, to make "propensity" useless as an explanatory term. We should have defined a class term while admitting that we could never know what particular items were members of that class. It would be somewhat as if a zoologist had defined for us the *Selachii* as fishes with skeletons of cartilage and not bone, but we were entirely confined to examination of the outer appearance of fishes so could never know which fishes had skeletons of cartilage and which of bone. If the objection which has been urged is a valid one, the conclusion would seem to be that we must base a dynamic psychology on concepts which do not involve this unrecognisable character of innateness.

This difficulty would, of course, disappear if we accepted McDougall's statement that the inborn propensities alone provide the driving forces manifested in all our activities. If all motive forces were derived from innate propensities, then, whenever we saw a human activity we should know that a propensity or system of propensities was active and that the whole of the energy displayed was derived from this innate source. Before discussing

the truth of this proposition, it may be well to make clear to ourselves the meaning of such terms as "motive force" and "energy" in describing human behaviour.

When we use these terms in psychology, we are using an obvious and convenient analogy from physical science.\* If a body previously at rest is set in motion, we attribute its new motion to the fact that it has drawn upon some external or internal source of energy. The speed with which it is set in motion depends not only on its mass but also on the energy supplied (the relationship is:  $\text{energy} = \frac{1}{2} m.v^2$ ). This energy is also shown by the difficulty of stopping the body when once set in motion.

We clearly need some analogous principle to explain variations of intensity in human activity. A man may be sitting idly when he perceives a dangerous object approaching him. He begins to run with great activity. His change from passivity to activity might be explained by saying that energy has been derived from his fear propensity. Similarly, he may be stirred to activity by hunger, or love, or anger. If he is strongly moved, his behaviour is intense and persistent. The energy or strength of motive force may be judged by the strength of the induced activity or by the difficulty with which it is stopped by such external forces as obstacles or social prohibitions, or by such internal forces as opposing impulses or the man's own volition.

\* It is sometimes said that this is not the case, because the meaning of "force" and "energy" was originally derived from man's mental experience and was only applied by analogy to the explanation of physical movement. This may have been true originally, but the physical meanings of "force" and "energy" have become so much now the standard ones, that in giving these terms psychological applications we are truly applying to behaviour a physical analogy, and it is necessary to remember that it is only an analogy. Undoubtedly an active man does use more physical energy, but this physical energy is not a measure of the psychological energy behind his activity. A man making responsible decisions under the stress of strong emotion may be expending physical energy at a lower rate than a navvy carrying out a habitual task.

It is clear from the examples given above that innate propensities may be sources of energy. The statement that these are the only sources of energy seems, however, to be contradicted by so much evidence that it is indefensible. We have already seen that the strength of human sexual activities and fear activities is certainly determined by other factors than the strength of inborn propensities. If we mean by a source of energy anything that can produce activity, we must include the habit systems and attitudes as sources of energy. A man may go each day for a walk after tea or go each day to his work, simply because these activities belong to habit systems. His activity of going to church or to a political meeting may similarly be determined by his attitudes. Although this would very generally be disputed, I think also that human volition must be regarded as a source of energy. A man may engage in such an activity as going to visit the dentist because he has resolved to do so although his habits and propensities both impel him to stay at home.

It does not seem even to be true that a propensity always provides a greater driving force than any of the other possible sources of activity. Certainly there is, in general, a tendency for this to be true and we commonly expect behaviour directed by a propensity to be more persistent and more resistant to change than any other kind of behaviour. An animal will show greater resentment if its eating or mating are interfered with than it will show to most other kinds of interference, and interference with these impulses in mankind also usually meets with greater resistance than interference with a mere system of habits. Habit systems also, however, show strong resistance to change, particularly in the old. There is no reason for supposing that the strong motive force of habits is always due to these being based on strong propensities. The motive force behind the drinking of alcoholic beverages is certainly a strong one (and social prohibition of it in the United States met with strong

resistance) but it has never been suggested that this is an innate propensity. There seems to be no sufficient reason for saying that all motive forces behind human activity come from the inborn propensities, nor even for the more moderate statement that such motive forces as come from innate propensities are necessarily the strongest ones.

To sum up, there seems to be no reason for denying the existence of human instincts or propensities if these are defined as innate motive forces behind behaviour. The word "instinct" is better avoided since it leads to serious misunderstanding. The usefulness of the word "propensity" is, however, seriously limited by the fact that we cannot know how much is innate and how much acquired of the driving force behind a human behaviour tendency. There seem to be strong reasons for rejecting the doctrine that the driving forces behind human activity are entirely derived from innate propensities.

#### **4. Dynamic Conceptions of Human Behaviour**

An argument which has been developed for the explanation of human behaviour in terms of human instincts or propensities is the sterility of the older method of approach which sought to give an account of the causes of a man's behaviour merely by treating it as a result of his thinking. This is the "intellectualist" method of explanation of behaviour of which the most ambitious example is the associationist psychology whose manifest failure to help in the understanding of human behaviour discouraged further attempts at the development of a system of human psychology along intellectualist lines.

On this matter most (perhaps all) modern psychologists would agree. This, however, is a general argument for a dynamic system of psychology, and not for a particular system of dynamic psychology. A dynamic psychology is one which treats man's behaviour and the general

directions (or tendencies) of his behaviour, and the driving forces behind behaviour, as themselves data and explanatory principles for the science of human nature.

A dynamic psychology may be mechanistic or purposive. A mechanistic psychology (such as reflexology and the extremer forms of behaviourism) conceives of human behaviour as determined by preceding causal sequences analogous with those of the physical world.\* A purposive psychology recognises another type of determination of behaviour by purposes or tendencies to seek goals. At the present time, the insufficiency of explanation in terms of non-purposive behaviour is increasingly recognised, although it has been suggested that the contrast between mechanistic and purposive conceptions is not an ultimate one, but may be due to the inadequacy of current conceptions of the nature of physical causation.<sup>152</sup>

If we decide that we cannot make much use of McDougall's conception of propensity because of the implication of innateness and the impossibility of knowing how much of what determines any human behaviour system is innate, we are left with the necessity of finding equivalent dynamic terms which have not that implication.

We find that human behaviour tends to be organised in systems which pursue different ends. A young man may spend eight hours of the day earning his living with breaks during which he eats, afterwards playing golf for an hour, and then going for a walk with the woman whom he intends to marry. The activities which serve the ends of

\* McDougall gives the name "hormic" to his own type of purposive dynamic psychology which asserts that man's activity seeks many goals because he is innately constituted in that way.<sup>153</sup> It is thus contrasted with "hedonic" psychology which is also purposive but attributes the pursuit of goals to the single innate disposition to seek pleasure and avoid pain. It is not quite clear whether the term "hormic" also implies the doctrine that our innate constitution is the only determinant of the goals we pursue. If so, the point of view of this book is purposive but neither hormic nor hedonic; if this is not implied, the point of view here outlined is also hormic although not the same as that of McDougall.

acquisition, of nutrition, of recreation, and of sex, have all called out his activity. With different degrees of certainty we suspect that an innate propensity underlies some at least of these, although some may in no sense be innately determined but entirely results of acquired sentiments or attitudes. We may use the term *tendency* for them all, admitting that some tendencies are, at least in part, determined by innate propensities.

It will not be doubted that some tendencies are more directly innately determined than others. The behaviour of running away from danger, or of hitting with the fists in anger, is obviously more primitive than shooting with a rifle at the dangerous object or relieving anger by making a sarcastic remark. To such primitive and relatively unlearned responses we may give the name *instinctive tendencies*, while recognising that in the adult even responses of this kind have not escaped the influence of acquired factors.

We need also a term for the energy behind a tendency and may conveniently adopt the term *drive*, now very commonly used.<sup>259</sup> Again, in speaking of a drive, we mean only that factor within the organism which impels it to activity, and we do not imply that it is necessarily an energy determined by the inborn constitution of the organism showing it, although we admit that some drives are, at least in part, so determined.

An emotion may be regarded as the effect on the organism of the system of stresses which accompany the activity of a drive. We have seen that an emotion is a process in time varying in intensity and in affective character with the changing relationship of the organism to the situation to which the emotion is a response. The nature of the stress when a drive is active is generally changing during the course of the behaviour to which it gives rise. In escaping from danger, an intense and painful stress is set up before action starts and when it is stopped, while the pleasurable relief from stress accompanies successful carrying out of the behaviour of escape.



Two conditions must generally be fulfilled in order that a behaviour response may occur; there must be an appropriate external stimulus or situation (the incentive) and an internal tendency to react (the drive). A female rat, for example, will not, at all times, retrieve young rats and bring them into a nest. Usually she will only do so after giving birth to young. This may be expressed by saying that she will not retrieve young except when the retrieving drive is active. If the drive is active, she will generally not show this behaviour in the absence of the incentive of young rats lying outside the nest. If the drive is very strong, however (the first day or two after birth), Wiesner has found that she shows retrieving behaviour even in the absence of the normal eliciting situation of young rats outside the nest.<sup>289</sup> At this time, he has found that she will retrieve a young rabbit, a young chick and even her own mate. A few days later, when the drive is less strong, it can only be elicited by young rats outside the nest, and, since the incentive value of smaller young ones is greater than that of larger ones, Wiesner has been able to devise an ingenious method of showing the decline in strength of the drive in the successive days after the birth by the fact that smaller and smaller baby rats must be used in order to elicit the reaction.

Similarly a man may be in an angry frame of mind when a very small annoyance can call out an aggressive response; he may, on the other hand, be in a placid state of mind when an aggressive response can only be called out by a great annoyance. The occurrence of a response depends, therefore, both on strength of incentive and strength of drive. In some cases a drive may be so strong as to produce the response without the presence of the appropriate incentive.\* Thus a man in a very angry state

\* We cannot, of course, assert the opposite proposition that an incentive may be so strong that it calls out a reaction in the complete absence of a drive, since we have no way of determining the presence or absence of drive except by the occurrence or non-occurrence of the corresponding reaction.

of mind may become violent without any external cause just as the mating reaction in some animals may be attempted in the absence of any possible mate.

Drives obviously differ amongst themselves in the extent to which an external incentive is necessary for the behaviour of the drive to appear. Food-seeking behaviour, for example, takes place when hunger starts without any external stimulation. It is not entirely independent of the presence of food, since the perception of attractive food may arouse the behaviour when the drive is still too weak to arouse it without that stimulation (although not when the strength of drive is at its minimum as immediately after a heavy meal). Tendencies which depend primarily on internal rhythm of drive strength for their appearance are generally called *appetites*.

It should be clear that there is no sharp line between appetites and non-appetitive tendencies. Many tendencies which would not ordinarily be called "appetites" are more or less dependent for their functioning on an internal rhythm of drive strength. We have already seen that sex and maternal drives may function without the normal external incentive and may thus be regarded as partly appetitive. Thus all tendencies may be regarded as lying somewhere on the line we may draw between the two extremes of the pure appetite, whose activity is entirely dependent on the internal factor of drive strength and independent of external stimulation, and the purely non-appetitive tendency with constant drive strength whose activity is determined by the presence of the appropriate outside stimulus. Hunger and thirst are obviously near the pure appetite end of this scale, whereas the tendency to the fear response is nearer to the other end of the scale.

The conception of drive is a psychological one based on observation of behaviour. We naturally ask how far a drive can be physiologically explained. If a drive shows periodic variation in strength (*i.e.* is more or less appetitive) we may hope to find a physiological process, such as

a secretion, whose intensity of activity is correlated with the strength of drive. Thus Wiesner has shown that the retrieving behaviour of rats is conditioned by a secretion from the anterior lobe of the pituitary and that this behaviour can be produced in a virgin rat by injection of an extract of the pituitary gland secretion.<sup>269</sup> Similar observations have been made for other components of maternal behaviour and for sexual behaviour. Thus the rise and wane of the strength of drive in these behaviour tendencies appears to be correlated with greater or lesser amounts of an endocrine secretion. The activation of the behaviour tendency must be supposed to be due physiologically to interaction between the endocrine secretion and some neural mechanism.

In the appetites of hunger and thirst, the corresponding physiological determinants of strength of drive appear not to be endocrine secretions but local conditions of the stomach and throat respectively. A nearly empty stomach contracts at fairly regular intervals, for about half a minute at first. During this contraction, pangs of hunger are felt and there is an impulsion to restless seeking for food (which we may call the *craving* for food). Of the conditions which determine this contraction, the most important is the concentration of blood-sugar; the stomach contraction (and the consequent food craving) disappearing when this concentration increases above a certain amount. The ultimate determinant of the food-seeking tendency appears thus also to be a chemical change in the blood.

The hunger pangs and the craving for food may both be abolished by any method of preventing the stomach contractions, such as smoking strong tobacco or pulling a belt tightly round the waist. Similarly, thirst and the corresponding craving for water are produced when the mouth is dry. Normally this occurs as a result of reduced activity of the salivary gland when insufficient water has been taken, but may be caused by breathing dry air and

temporarily relieved by washing out the mouth with water without drinking.

Another way of approaching the problem of giving an explanation of behaviour in dynamic terms is that adopted by the Gestalt psychologists. Many objects have an immediate psychological effect on a man's behaviour, some attract him to eating, grasping, or climbing, while others repel him. His behaviour may be attributed to the existence of forces existing between the man himself and these objects of his environment. It is obvious, of course, that these forces do not belong as physical forces to the objects themselves so we must make Koffka's distinction between the external physical objects of a man's geographical environment and the objects as they exist for his perception and feeling—the objects of his "behavioural" environment.\* These imperative influences on behaviour of the objects of a man's behavioural environment are called by Lewin the *valences* of the objects<sup>144</sup> ("valence" is the generally accepted English translation of Lewin's *ausserforderungscharakter*—literally "demand character"). We cannot correctly describe the behavioural environment of a man without including the valences of the objects by which he is surrounded—the character of this object as desirable food, of that as a weapon, and of another as a danger to be avoided.

The use of the term "valence" should imply nothing about the innateness of this property of behavioural objects. Some valences are probably inborn; loud sounds seem clearly to belong to the class of behavioural objects with innate negative valences. The negative valences of snakes may be acquired. It is clear that there is an intermediate possibility that there may be an innate predisposition to the formation of certain valences, which will not be formed unless the individual happens to have the experiences necessary to lead to their acquirement but which will nevertheless be more easily acquired in this way

\* See p. 244.

than other valences. A negative valence, for example, may perhaps more easily become attached to snakes than to rabbits. Which of these possibilities is true of any particular valence can only be discovered by experimental enquiry.

Koffka criticises McDougall's conception of a propensity as a source of energy on the ground that it gives an incomplete account of the dynamics of activity,<sup>132</sup> and prefers the explanation in terms of forces between the person acting and the behavioural object. This criticism, if valid, would obviously apply equally to any energy theory and not only to a theory of innate sources of energy. The "valence" hypothesis is, however, in no sense an alternative to an "energy" hypothesis; it is an answer to a different question. If we ask what force drives a motor car forward, the answer is that it is the reaction of the road surface to the rotation of the wheels. If, on the other hand, we ask what is the source of energy for the car's motion, the answer is that it is the combustion of petrol in its engine. The first is analogous to the question which Koffka is trying to answer, the second to that which McDougall is trying to answer. The answer to the second question is necessary if we are to explain why the car moves at all although a fuller account of the dynamics of the motion requires also the first answer.

## CHAPTER VIII

### THE TRANSFORMATIONS OF BEHAVIOUR TENDENCIES

#### 1. Some Social Problems of Behaviour Tendencies

The strength of drive behind certain behaviour tendencies produces practical problems for the educator, the legislator and the psychotherapist.

First, some kinds of behaviour are socially undesirable. These must be inhibited (or "suppressed"), if possible, by building up attitudes incompatible with them. If this method is unsuccessful, more forcible methods (such as legal punishment) must be resorted to. Thus, mere individual quarrelsomeness is a socially undesirable expression of the tendency of pugnacity. It is more common amongst schoolboys than amongst adults, its suppression taking place very largely by the growth of sentiments against quarrelsomeness implanted partly by education, and partly by social disapproval of quarrelling.

Secondly, most drives have modes of expression regarded as socially desirable. Thus, the expression of pugnacity in willingness to take part in warfare for one's country is a social asset to a state which needs an army for its defence. This mode of expression of pugnacity is carefully fostered by the military training of schoolboys, part of which training consists in the development of martial attitudes. The prestige of the military profession is also raised by the use of brilliant uniforms and by the conferring on its higher ranks of titles of respect. The directing of aggressive tendencies into this channel is thus made easy by training, and attractive by the marks of social approval given to it.

There is lastly the problem of the redirection of energies which are behind tendencies which are socially undesirable. The total suppression of a tendency with a strong drive behind it may be difficult, and may be accomplished only at the cost of serious mental disharmony to the individual in question. On the other hand, it may be comparatively easy to find a substitute activity in which the drive finds an outlet in a harmless or a desirable way. Thus a group of boys who band themselves together and fight neighbouring groups in the streets may be given a substitute activity by organising them as a football team. An individual who finds that the effort to abandon the habit of smoking imposes an intolerable strain on him may find the change relatively easy if he substitutes for smoking the chewing of gum.

We may use the general term *transformation* for all the changes which take place in behaviour tendencies as a result of social prohibition or encouragement. For that particular kind of transformation which consists in finding substitute outlets for the energy behind a tendency, we shall use the term *deflection*.

## 2. Canalisation

*Canalisation* is the name we can give to the least drastic of the forms of social control of individual tendencies. When a widely flowing river is artificially confined within narrow banks, it is said to be "canalised." In the same way, a tendency may not be allowed free expression in all ways, but be tolerated only on condition that it is restricted to some part of its possible behaviour. Thus the soldier is allowed to exercise his pugnacity against the enemy but not against his comrades. His aggressiveness or pugnacity is canalised. Social approval is given to sexual behaviour provided the object of it is a man's lawful wife only. This canalisation is not merely a social requirement imposed on a promiscuous innate tendency,

since there is undoubtedly an innate tendency towards the restriction of sexual behaviour to one object. The social forces favouring monogamy in a monogamous society reinforce this inborn tendency towards the limitation of sexual behaviour to a single person.

### 3. Repression

The importance of substitute activities in promoting harmony of mental life has been emphasised by the psychotherapeutic theories and practice of Freud.<sup>83</sup> He has taught that the root cause of the mental disharmony of psycho-neurosis is the failure of tendencies belonging to the sexual system to find adequate expression in behaviour. Such tendencies, for example, as the infantile passionate love for the Mother, which he believes to develop in the early years of the male child, may persist and find no permissible outlet in behaviour. Through the tendency of the mind automatically to adjust itself so as to exclude painful contents, such an urgent unfulfilled conative tendency (or "wish") tends to pass out of consciousness altogether. It is then said to be *repressed*. The characteristic of a repressed tendency is that there is a peculiar difficulty in making it accessible to introspection at all. Freud, therefore, says that such an idea is *unconscious*, or, better, that it belongs to the *system of the Unconscious*.<sup>84</sup>

Since many mental systems which are not repressed (such as dispositions as distinct from processes) are, by their very nature, not accessible to introspection, it may be suggested that the term "unconscious" is not a good one, and that it leads to a good deal of unnecessary and barren controversy with philosophers. It would probably be better to adopt a suggestion made by Broad and speak of such mental content as "inaccessible" instead of "unconscious,"<sup>85</sup> but Freud's terminology seems now



to be too firmly rooted in psychological literature to be replaced.

The importance of repression in psychology (and particularly in psychopathology) lies in the fact that it has been claimed to be the root cause of many mental disorders, certainly of the psycho-neuroses, possibly also of some of the psychoses. From the point of view of consciousness a repressed system may appear to be converted into its opposite. A sentiment of love repressed may give rise to a conscious aversion to the person loved. A strong tendency to pugnacity, similarly repressed, may give rise in consciousness (and in actual behaviour) to a peculiarly strongly developed tendency to meekness. In these cases, what is appearing in consciousness and in behaviour is not the repressed sentiment but the system by which it is repressed. Such a replacement of a repressed behaviour tendency by its opposite is called *compensation*.

Part of the psycho-analytic cure for a psycho-neurotic is the redirecting of his repressed energy into a socially desirable channel. To this process, Freud has given the name *sublimation*.

#### 4. Deflection

Sublimation is a special case of the more general process of finding a substitute outlet for a suppressed drive. For this general process, we may use the word *deflection*. The psycho-analytical use of the word "sublimation" is for a socially desirable deflection. Thus Freud says: "They [the sexual forces] are . . . sublimated, that is to say, their energy is turned aside from its sexual goal and diverted towards other ends, no longer sexual and *socially more valuable*"<sup>83</sup> (The italics are mine.)

It is clear that the introduction of a judgment of social value into the definition of a term makes that term of doubtful validity in scientific psychology. A deflection is not of essentially different psychological nature by being

socially desirable. A man who deflects his sex instinct after a disappointment in love by playing beautifully on the violin may be said to be sublimating it, since his mode of expression is socially desirable because it gives pleasure to other people; but clearly it is exactly the same psychological process as would be his activity if his disappointment led him to play badly on the bagpipes.

In a less simple form, the same problem arises in other cases of sublimation. The man who gave his life to religious activity has provided an example of sublimation if we accept the view of religious persons that the religious life is a socially desirable mode of behaviour, but other persons consider it useless. Whether the religious person is sublimating or not can only be decided if we know whether religion is a desirable or an undesirable outlet for otherwise unsatisfied tendencies. This is clearly not a psychological question at all. Much confusion could be saved if we abandoned the word *sublimation* as a psychological term altogether and spoke of all re-directions of instincts as *deflections*, whether they were socially desirable or not.

The conception of deflection implies an extension of our idea of the relationship between a drive and a tendency. If energy belonging to the sex drive can activate musical composition, scientific research, and so on, we must suppose that a particular drive is not indissolubly linked to a particular tendency but may, within limits, be diverted to other tendencies. The ease of diversion may depend on the resemblance between the new and the old tendency. Probably a deflection takes place most easily when the new tendency is closely related to the old, although under this condition the re-direction of energy may be less stable.

Let us suppose that a homosexual man wishes to rid himself of the temptation to overt homosexual behaviour by deflecting his energy. To advise him to devote his energy to the organisation of Girl Guides would be useless, for the suggested deflection would not enlist the energy from his repressed impulse. He might make a successful deflection by organising Boy Scouts because this new channel of behaviour is closely related to the original tendency, but, for this very reason, the new activity

may be an encouragement for the drive again to activate the old tendency that he is trying to suppress. In every attempted deflection a balance must be made between these two requirements, a sufficient resemblance between the two tendencies for successful deflection to take place, but a resemblance not so close that the new tendency reinforces the old.

Although we may use such terms as "transformation" and "deflection" for the change of direction of instinctive (*i.e.* innately determined) tendencies, an acquired tendency may also be subject to this process. The terms, therefore, do not imply the innateness of the tendency to which they are applied. Freud, for example, believes that passive algolagnia or masochism (sexual excitement by the infliction on oneself of pain) is due to a transformation of active algolagnia or sadism, which he believes to be an innate tendency.<sup>83</sup> Masochism itself may, nevertheless, be sublimated. Similarly a strongly developed drive towards aggressive behaviour must be deflected into socially desirable channels. It makes no difference to this social necessity that the aggressive tendency may be the result less of an innate tendency than of a reinforcement of aggressive impulses through the experiences of the individual earlier in life.

The term "sublimation" was originally used by Freud of deflections of sexual tendencies. He used the word "sexual" very widely to include all love impulses, even those of early childhood, and maintained that many of the adult tendencies which other psychologists supposed were separate instincts or acquired habit systems were in reality transformations of the sex instinct—as, for example, the social tendencies, curiosity, fear, and aggression. This doctrine has sometimes been called *pan-sexualism*.\*

\* This term does not, of course, imply that Freud taught that all tendencies were sexual in their origin. Very early he believed in a self-directed group of instincts opposed to the object-directed tendencies of sex. Later he claimed to have demonstrated the existence of a self-destructive group of "death instincts."

It is true that the drive behind sexual behaviour is exceptionally strong and persistent and is very commonly subjected to partial or complete suppression. For both of these reasons it is particularly prone to require an outlet in some substitute form of behaviour. Persistence of drive and partial suppression are not, however confined to the sexual tendency and the conception of transformation may be applied to other behaviour tendencies.\* Thus the transformations of self-assertive tendencies have been studied by Adler,<sup>3</sup> and Bovet has written an acute study of the transformations of the aggressive tendency (or fighting instinct).<sup>39</sup> Before any of these authors had written, William James had suggested the necessity for finding a substitute outlet for the aggressive tendencies which could no longer usefully be employed in war, and suggested that in voluntarily accepted poverty such as that of the ascetic saints we might find a life heroic and pugnacious enough to give satisfaction to the aggressive tendency.<sup>118</sup>

Deflection of the aggressive tendencies may be considered to be taking place when a man finds an outlet for these by fighting against the forces of nature in mountaineering,† or by fighting against the forces of evil in the

\* It may well be doubted, however, whether these principles apply to all tendencies or even to all tendencies that are very largely instinctive. Graham Wallas implies that any instinctive tendency deprived of its primitive outlet will set up a condition of mental instability which can only be relieved by giving it another outlet<sup>382</sup> He speaks of the resultant state of tension as that due to a "balked disposition" It seems more likely that Dickenson is right in suggesting that this necessity for an alternative outlet occurs only with such impulses as sex, hunger, exercise, etc., whose drives are determined by secretions or by chemical deficiencies in the blood stream<sup>65</sup>

† It may not be obvious to those ignorant of mountaineering why this should be regarded as a fighting sport. Bovet gives an interesting example of a mountaineer describing his sport in martial terms "This amphitheatre is formed of La Maya, Mont Dolent, the Aiguilles Rouges, the Tour Noir, and Darrel which unite in a wall the better to bar the way, and which brutally rend the azure with their gigantic battlements. One would say that it was their mission to defend the approach to

religious life, or by fighting against war as a pacifist. Perhaps part of the importance of competitive games in social life is that they provide a harmless outlet for aggressive tendencies. Even the most military state cannot employ all its males permanently in warfare, so there must generally be a partial suppression of their pugnacity. The competitive games engaged in by armies in peace time (and by civilians) not only keep their bodies in fit condition for war service, but also serve the psychological function of giving an outlet to their innate aggressive tendencies from which they can be diverted, when the need comes, to actual warfare.

When we ask how we are to obtain conclusive evidence that one behaviour tendency is a deflection of another, there seems to be no altogether satisfactory answer. This relationship is often asserted on very flimsy evidence or none at all. Two lines of evidence seem mainly to be relied on: first, that of some resemblance in character or in associated symbolism between the original and the deflected tendency, and, secondly, that of an inverse relationship between the intensities of activity of the two tendencies.

The first kind of evidence has been most commonly used. Religion for example, is a channel into which many unsatisfied tendencies may be deflected. Sexual symbolism in religion, and the use of the language of sex-love in describing the relationship of the soul to God (particularly common amongst the mystics) have been put forward as evidence that the sexual tendency is a source of energy

the white solitudes which stretch on the other side . . . . From time to time boulders leap down the great couloirs, wait a little, and as it were a trial-avalanche rolls down; anon all is silent, and this circle of giants remains there, terribly immobile, regarding you expectantly. Then—most insignificant and delicate little being, made only of flesh and blood—you arrive in the presence of these walls of granite and ice, and you oppose to them, it would seem, something yet stronger and more indomitable than themselves. . . ."<sup>118</sup>

for religious activity. Similarly, there is much in the language and symbolism of religion which suggests a re-direction into religious channels of the infantile feeling towards the parents.

The martial symbolism of early Christianity, and of the Salvation Army has suggested to some psychologists that aggressive tendencies have been deflected into the religious channel.

The most satisfactory evidence, however, that any particular behaviour tendency is a deflection from some earlier tendency would seem to be that of the second kind. This kind of evidence would require that an inverse relationship should be observed between the activity of the two tendencies. If it is true for example, that a young man devoted to playing the piano is deflecting his sex tendencies, we should find that the playing of the piano decreases the urgency of his sex needs, and that when he is sexually satisfied, the urgency of the impulse to play disappears. This would plainly not be conclusive since there is a limited fund of energy for all activities, and to justify the statement that the piano playing was a deflection of the sex tendency it would be necessary to show that the inverse relationship between his piano playing and sex activity was greater than that between these and any other tendencies, such as his aggressiveness, or his playing at draughts.

Clearly, it is generally impossible to obtain such convincing experimental evidence that any individual is deflecting the energy of one tendency into the activity of some other tendency. An observer of human behaviour may feel that his own intuitive insight into motivation tells him that there are such inter-relationships between the different behaviour systems in a given individual, but he will not be able to support this conclusion by evidence which would convince a critical psychologist who was uncertain whether there was any such mechanism as deflection.

## 5. Sexual Regulation and Cultural Achievement

It seems more likely that evidence might be obtained from a study of the effectiveness of deflection on a larger scale as a social phenomenon. Freud believes that all civilisation has been built up as a result of the deflection of energy derived from the sex tendencies by the imposition of regulations limiting permissible sexual behaviour. This hypothesis has received important confirmation on the anthropological side from the work of J. D. Unwin.<sup>254, 255</sup>

Unwin has classified the cultures of eighty uncivilised societies in accordance with their religious rites as: *Deistic* in which temples are erected, *Manistic* in which there are no temples but some kind of post-funeral attention is paid to the dead, *Zoistic* in which neither temples are erected nor post-funeral rites carried out. He claims to find an invariable correlation between the degrees of culture as above defined and the amount of pre-nuptial restriction of sexual freedom permitted in the society. Those societies which have permitted complete pre-nuptial sexual freedom (apart from the requirements of exogamy and the prohibited degrees of relationship) have been in the zoistic condition, and *vice versa*; those which have compelled an irregular or occasional pre-nuptial continence have been in the manistic condition, and *vice versa*; those which have insisted on pre-nuptial chastity have been in the deistic condition and *vice versa*.

Unwin lays down the general law: *The cultural condition of any society in any geographical environment is conditioned by its past and present methods of regulating the relations between the sexes.* It is to be noted that the evidence for the methods of regulating sexual relations is the existence or non-existence of legally enforced penalties for sexual irregularities. Pre-nuptial chastity is regarded as proved if (and only if) proofs of virginity were demanded from a bride.

There is also distinguished a higher stage of culture called the "rationalistic," attained only by a few civilised

societies. Civilised societies which are not rationalistic may be completely deistic, or deistic with a rationalistic stratum. In such societies, pre-nuptial chastity is taken for granted and cultural differences correspond to degrees of freedom in post-nuptial sexual relationships. The highest degree of that social energy which produces cultural advancement is shown by those peoples who have adopted absolute monogamy (in which both partners in marriage have confined their sexual activities to the other). A lesser degree is shown by those adopting absolute polygamy (in which the female partner only is thus confined), and still less in modified monogamy or polygamy (in which neither partner is completely confined to the other). He traces the history of the civilisations of the past, showing that changes in their social energy and their consequent cultural achievements followed changes in the severity of the restrictions placed on their post-nuptial freedom after an interval of about three generations (or about a century). For some reason, it seems to be the sexual freedom of the women rather than that of the men which is correlated with the loss of social energy.

If Unwin's theory is true, it offers a clue to the understanding of the process of cultural change and suggests ways in which this process might be controlled. It also has the rare merit of being based on an induction from all of the available evidence. Its very importance makes it necessary to examine critically its foundations. The most doubtful point seems to be the assumption that we can infer a group's sexual behaviour from its sexual regulations. It is possible that a community which has no prescribed penalties against pre-nuptial sexual intercourse may not be, as Unwin assumes, one in which such conduct is common but rather one in which it is rare or unknown, while the imposition of severe penalties may mean that pre-nuptial freedom is becoming common. That this is the case seems probable on analogy with the relationship between other offences and the presence of legal penalties.



If this were the case, Unwin's evidence would indicate a necessary relationship between the condition of culture and the penalties imposed for sexual freedom but not with restriction of this freedom. A possible interpretation would then be that an increase in what Unwin calls the "energy" of a society might be itself the cause both of cultural advancement and of a breaking through of previously accepted sexual prohibitions necessitating stronger legal enforcement of them. This would be a much less important conclusion. It is also necessary to remind ourselves of the danger of inferring from the existence of a correlation between A and B, the conclusion that A is the cause of B. It may be so, but also A and B may be both effects of some other causal factor C.\*

#### 6. Objectification, Subjectification, Idealisation, and Platonisation

There are four more kinds of transformation of minor importance distinguished by Bovet.<sup>29</sup> The first of these he calls *objectification*. This is the change which takes place when a man satisfies his tendency by watching the action to which it normally leads instead of taking part in it. Aggression is objectified by the child or man who looks on at fights instead of fighting. The fighting play of children does not always take the form of playful fights with their comrades, but sometimes of playing with toy soldiers or organising mock conflicts between other children. The lead soldier serves the purpose of this objectification in play of the fighting tendency. The watching of gladiatorial combats and boxing matches is a similar objectification. The objectification of the sexual tendency is found in the *voyeur*, who can obtain his gratification only by watching, not by actually taking part in sexual behaviour.

Like other kinds of transformation, the sociological importance of objectification is that it can provide a socially

\* See p. 409.

harmless substitute for otherwise objectionable activities. The child is allowed by its parents to play with lead soldiers, and is not allowed to fight with its friends. The adult man is allowed to watch a boxing competition, but not to engage in rioting.

*Subjectification* is the name given to the turning of a tendency on to the subject himself instead of on to an outside object. In the objectification of aggressive tendencies, one watches other persons receiving blows; if the aggression is subjectified, passive algolagnia develops and the subject desires to receive blows himself.\*

Humility, submission and devotion, voluntary subjection, flagellantism and masochism are instanced by Adler as effects of this phenomenon.<sup>3</sup> Autoerotism would seem to be a similar subjectification of the sex tendency.

Subjectification is of psychopathological interest and not of direct social importance. None of its manifestations are ordinarily socially encouraged. It is socially more desirable that the fervent ascetic should scourge himself than that he should employ his weapons against other people, but, if this is really a re-direction of the aggressive tendency, at least we must admit that it is possible to find other modes of expression of greater social value.

The word *idealisation* may be used of a special kind of deflection in which the object to which the tendency has been re-directed has no material existence, but exists on the ideal plane only. Thus, while the mountaineer has a material object for his pugnacity in the mountain, the Salvation Army, fighting against moral evil, has an opponent existing on the ideal plane. Love also may be given to an ideal object, instead of to an actual person. In this case the sex tendency may be said to be idealised.

In idealisation, the object towards which the transformed tendency is directed is not a physical one; in

\* This is Adler's explanation of passive algolagnia. It is altogether different from the Freudian explanation of it as a compensation phenomenon resulting from repressed sadism

*Platonisation*, there is a physical object but the behaviour itself undergoes the same change as takes place in the object in *idealisation*. The word *Platonisation* is taken from this mode of transformation of the sex instinct—Platonic love. Platonic love has a real sex object but has lost the physical sexual behaviour. Its love behaviour is entirely on the mental or ideal plane. Similarly one can have pugnacity against a real opponent without an external physical contest. The example taken by Bovet is the playing of chess. There is a real opponent in chess, but the fighting is on the mental plane. Intellectual controversy is a Platonisation of the aggressive tendencies rather nearer to the primitive pugnacious behaviour than the playing of chess, and one could trace a continuous series (through political controversy and boxing matches) between the completely Platonic fighting of the chess player and primitive physical fighting.

Platonisation (in varying degrees) is an important mode of disposing of certain instincts, for it is capable of providing what is generally useless but entirely unobjectionable behaviour in place of instinctive behaviour socially undesirable. Two old gentlemen playing chess are of little direct value to society, but at least they are not doing the harm to the social organisation that they would if they exercised their instinct of pugnacity in brawling. Similarly, Platonic lovers do nothing for the increase of the race, but they do not undermine established social conventions by immoral behaviour.\*

\* It may be noticed that there are abnormal forms of sexual desire of which the only expression socially tolerated is Platonic love. The Platonisation of his love behaviour is a necessary adaptation of the homosexual to the requirements of a society in which unmodified homosexual behaviour is not tolerated.

## CHAPTER IX

### HUNGER, FEAR AND SEX

#### 1. Hunger

Different behaviour tendencies play very different parts in the pattern of behaviour underlying a social system. Hunger is generally recognised as one of the dominant driving forces behind all human activity. No one will doubt that this is the case, yet, amongst a very large proportion of a civilised community, acute hunger and the strong and unpleasant affective stress associated with it are never experienced. The man goes to work, his wife buys and prepares his food, and both eat meals regularly before the tension of the unsatisfied hunger drive has become acute. They have built up a system of habits conditioned by the pattern of their cultural environment such that the unpleasurable tension of real hunger experience need never be experienced.

It is in this sense that hunger is a dominant driving force behind their activities. They need not experience it and they need not even think about it. It is in the background as a possibility if the man stops working or his wife stops buying food. There are many reasons for the continuance of these habit systems, but this background threat of hunger is the most important.

In other more primitive communities and even in other social classes within the same civilised community, life is not so organised. From time to time, the tension of the hunger drive becomes real and compelling, and activity is an urgent response to this actual tension and not merely a means of preventing it from ever becoming actual.

There are few more important differences between different societies than that between those in which habit systems can be so arranged that the tension of hunger never becomes actual and those in which activity is spurred by real shortage of food. In all communities the basic economic problem is that of securing sufficient food for its members, but in the first kind of society this basic problem has been so satisfactorily solved that many other incentives determine activity and the members of the society are able to pursue cultural activities such as art and science not directly connected with the attainment of food, while such activities have little attraction for those who are living under the lash of recurrent hunger.

Under certain conditions the impulses of hunger become very strong and tend to be prepotent over those of most other behaviour tendencies. If no food is taken but all the water that is required, apparently the hunger drive does not persist at great strength after the first day or two. The maximum strength of hunger drive is to be found if food is taken at intervals but insufficient in amount to appease the pangs of hunger. In populations suffering from famine, this condition is very generally fulfilled, and under these conditions it is very commonly found that food-seeking impulses take precedence over the system of social and altruistic tendencies on which ordinary social adjustments depend. Although there are accounts of heroic self-sacrifice under conditions of prolonged hunger, these seem to be very exceptional. Even sex and parental love are not apparently generally able to survive in competition with the abnormal strength of the food-seeking drive under conditions of famine.

Fasting, *i.e.* complete or partial voluntary abstinence from food is very commonly found as a religious obligation. Partial abstinence is generally an ascetic practice whose object is to attain voluntary control over the hunger drive and the consequent character modifications which result

from its deflection (not, I think, the mere strengthening of the capacity for voluntary choice, as William James supposed).<sup>115</sup> Total abstention from food appears to lead to great imaginative productiveness and is used in various religions (such as shamanism) for the artificial production of visions. Little or no experimental work has been done on this interesting result of fasting. Apparently a similar result may follow from even partial abstention from food. A philosopher, insufficiently fed in a war prison camp, produced several sonnets every day, although he had written none before, and felt no inclination to do so after he returned to normal feeding habits.

Food and drink are primarily means of satisfying hunger and thirst. They play, however, a much larger part in social life than this. They may become the centre of rituals which serve a religious or social purpose, and may be the objects which are given as gifts or used for economic exchange. Many different behaviour tendencies may thus play a part in the activity of eating and drinking. The dinner party in our civilisation is not primarily a method of satisfying hunger but is a social rite which cements comradeship within a social group and may also serve as a social display of the wealth of the host.

## 2. Fear

This also is a drive whose affect as a response to danger is rarely experienced by the civilised individual. Yet the potentiality of a fear response is present in the background as a motive for much human behaviour. We do not fear motor vehicles on roads or the system of police and judges and prisons, in the sense of actually experiencing the emotional tension of the fear drive in connection with them except on very rare occasions. Because these things exist, we have built up habit systems of avoidance, and so long as these habit systems are functioning effectively we avoid both danger and the emotion of fear.

I have said that fear as a response to danger is rarely experienced by the civilised man. This does not mean that the affective tension of fear is necessarily a rare experience to him; it may be a very common one. There are other sources of fear than danger situations, and many people are made miserable by fears which have some other source. All such fears may be called "neurotic fears." The word "anxiety" is very commonly used for this purpose (as the English translation of the German *angst*) but in its ordinary use "anxiety" implies a mildness of affective tone which is not necessarily a characteristic of neurotic fear.

Neurotic fears are found in childhood, and most children suffer from nightmares or outbreaks of neurotic fear during sleep during the years about the age of five. It has been suggested that the mastering of neurotic fears is one of the central emotional problems of childhood. Freud has explained fear as the recurrence of the experience of being born,\* and attributes the occurrence of neurotic fear to the repression of any other emotional disposition, particularly that of sex.<sup>83</sup> Neurotic fear has also been explained (as has been mentioned earlier†) as due to the formation of conditioned fear reflexes

As in the case of hunger, we can distinguish two very different relationships of a society to the danger situations producing fear. There are those, like our own settled condition of society, in which actual danger experiences producing strong fear are very rare, being almost entirely successfully avoided by habit systems which have that

\* An interesting suggestion which should be easily verified or refuted by observation since those who were delivered by Caesarian section should not later have the ordinary experience of fear. Freud, however, rules out this possibility of verification by saying that these will also have the experience of fear "since it is deeply ingrained in the organism through countless generations."<sup>83</sup> This assumption makes the hypothesis unverifiable and almost meaningless

† See p 72.

end. There are others in which danger from wild beasts or enemies may intermittently call out strong emotions of fear, which are the direct causes of escaping behaviour. In some primitive societies this is a more or less normal condition, and a very small breakdown in our settled civilisation, such as war or revolution, is all that is needed to reinstate it amongst ourselves. Civilisation, which has built for its favoured members a protection against occasions for hunger and normal (non-neurotic) fear has not removed these occasions very far from possibility.

There seem to be certain characteristic reactions to this situation of frequent activation of the fear tension. The natives in many parts of Africa are surrounded by both real and imaginary dangers. The fear tensions aroused by actual danger seem to have the power of creating objects for themselves in the form of hostile spiritual influences. Fear enters to some extent into most religions either by creating safeguards against fear or by creating spiritual causes of fear. The latter are relatively rare in the religions developed in societies whose members are protected against dangers, but may recur when they are exposed to physical dangers over a prolonged period so that intermittent fear tensions are regularly experienced. In this way, Davenport explains some of the pathological characters of the camp meetings amongst the American settlers who were moving into previously uncolonised parts of the United States.<sup>99</sup> Indians and snakes provided real danger, and the fear tendency activated by these things was ready to respond to the supernatural terrors of Hell

Habitual exposure to situations calling up strong fear is unpleasant and leads to undesirable psychological and social consequences. On the other hand, the fear reaction of the sympathetic nervous system and endocrine glands, if not too strong or continuous, is stimulating and has pleasant after-effects. It may even be physiologically beneficial; our bodies may not be adapted to complete



absence of the fear impulse.\* Many of the play activities of adults, such as climbing, ski-ing, and sailing, may owe much of their attractiveness to the stimulating effects of an excitation of the emotional mechanism of fear which is not sufficiently powerful to be disagreeable. The ideal play activity of this order is one which combines sufficient excitation of the emotional mechanism of fear with the minimum of real danger of injury or death. The attractiveness of the prospect of war and revolution to some of the young is largely owing to the craving for the experience of fear. Actual war is an unsatisfactory way of satisfying this craving, leading to much injury and death and often to the arousal of fear to an extent which is neither stimulating nor pleasurable. It is better that those who have this craving should find a harmless outlet for it in aeroplanes or motor-bicycles or in other serious or playful fear-exciting activities.

The rôle of fear as a factor in social organisation is much exaggerated by those, like Hobbes, who attribute socialised conduct mainly to fear.<sup>101</sup> Hobbes believed that animals had social instincts but denied these to man, and thought that the instincts of men were such as to lead them inevitably into a war "of every man against every man." There certainly is, in every civilised community, a system of laws enforced by punishment, restricting the liberty of every man to pursue his own ends at the expense of his neighbours. These laws are not, however, the only forces making for socialised conduct in a community. They merely reinforce social attitudes, partly acquired and

\* This is merely a suggestion for physiological research. The same may be true of the tension of hunger. Our ancestors who fasted and feasted may have been living in a way closer to that for which our digestive systems were adapted than our own way of moderation and regularity in feeding habits. "Moderation in all things" may not be the essential rule for efficient bodily functioning except in old age. It is possible that most people profit from occasional extremes—satiation, hunger and fear.

partly based on inborn tendencies to conform to social requirements. Amongst primitive communities these attitudes may play so much the larger part in producing social conformity that criminal deviations from accepted social requirements are relatively rare so there is little law and few punishments.<sup>282</sup> Civilised rulers of primitive people generally regard it as their duty to enforce a code of conduct which is not the traditional one of the people and which, therefore, is not supported by existing social attitudes. So it happens that they bring as one of the first gifts of civilisation a system of penalties of great severity, and there tends to result an unhappy approximation to the condition of rule by fear.

### 3. Sex

Another of the basic human drives is that of sex, whose characteristic emotion is called "love" or "tenderness."\* The sex drive itself is organised as part of a large system which includes the impulse to mate, to care for young, and the reciprocal tendency of the young to form attachments to their parents. Drives belonging to this system also provide a considerable part of the motive force behind other behaviour tendencies such as acquisitiveness and pugnacity. This whole system may be called the "reproductive system."

It has been argued by biologists that the impulse to mate is not the same as the impulse to reproduce since reproduction takes place without mating early in the evolutionary scale, and the first activity analogous with mating is the union of two individuals which is occasionally observed amongst primitive organisms which reproduce in some other manner. This may be true in biological history

\* If we use the word "love" for a sentiment, the term "tender emotion" may conveniently be given to the emotion which is commonly called "love." In popular speech the same word "love" is given both to a sentiment and to an emotion.

and should warn us against treating the drive to mate and the drive to reproduce as necessarily identical. Nevertheless, they have acted together for so long that they have become inextricably entwined in human psychology, and their appearance as separate drives, although found amongst some individuals, is exceptional.

It was at one time supposed that the mating of most animals was promiscuous and that sexual restrictions amongst men were an artificial check placed on an innately promiscuous sex tendency. More careful observation of animal mating has shown that this view is untenable. Some animals are polygamous but promiscuous mating is not common.<sup>7</sup> Permanent monogamy is found only amongst the higher animals. It is also important to notice that (contrary to a common opinion) permanent monogamous mating is often found amongst animals living in herds. Alverdes gives as examples of this: gorillas, probably chimpanzees, rabbits, and probably such gregariously breeding birds as herons, penguins, sea-gulls, etc.<sup>7</sup> Other animals (as, for example, horses) are polygynous but not promiscuous. It is to be noted, moreover, that monogamy within a herd is to be found amongst the animals most closely related to man, so it is probable that so far as man's sexual behaviour is innately determined, it is likely to be in the direction of monogamy.

When we speak of animals as permanently monogamous, however, this does not mean that infidelity is unknown. There are obvious difficulties in observing gorillas and chimpanzees in the wild state, so I do not think that we have any evidence as to whether or not they are occasionally unfaithful to their mates. It has been found, however, that male rabbits indulge in accessory promiscuity, copulating with unmated females.<sup>7</sup> Observers have also observed extra-marital mating amongst birds (grebe) which is resented by the permanent mate.<sup>108</sup> The presence of social prohibitions of breach of monogamy amongst monogamous human societies is, therefore, to be taken

as evidence that the tendency to monogamy is not absolute rather than that it does not exist.

One of the reasons for the earlier belief in animal promiscuity was that it was stated to have been observed amongst captive animals. The conditions of captivity, however, probably produce profound changes in animals' behaviour tendencies, and, similarly, the conditions of the social life of civilised man may be less favourable to monogamy than his earlier state.

The psychological reason for monogamy is that a sentiment of love tends to be produced for a particular person and this sentiment, being reinforced by the emotions generated in the act of mating and by those of parenthood, tends to endure. If it were absolutely permanent and if its effects were to inhibit altogether all possibility of sexual response to any other mate, man would be completely monogamous. In fact, he is incompletely so. In monogamous societies there are, therefore, social and legal sanctions against breach of the monogamous relationship. Polygyny is also a common pattern of marital relationship (polyandry much rarer). Polygyny may be confined to chiefs, and may be an essential source of their prestige and wealth (as in the Trobriand Islands).<sup>103</sup> In some cases commoners have more than one wife. Probably in many cases of polygyny, the husband is mating with only one wife during any period of time, although all his previous mates have legally the status of wives. Biologically, this would be a state of impermanent monogamy.

Thus while it is probably true that there is much in man's inborn nature which favours more or less monogamous unions, this predisposition is not so strong that it cannot be overcome by a social tradition of polygamy, or even so strong that it will maintain absolute monogamy in a monogamous society without the added force of social sanctions.

While promiscuity is not the marital pattern of any human society, a large measure of pre-nuptial freedom is

sometimes found. In the Trobriand Islands, for example, sexual play is found amongst the children, and as soon as they are old enough to mate, they form impermanent unions.<sup>163</sup> There is no social disapproval of unmarried people sleeping together, although there would be strong disapproval of their eating together (which would be a symbol of marriage).<sup>\*</sup> These impermanent unions lead ultimately to the choice of a life-partner with whom a monogamous union is formed and a family is founded.

Thus amongst these people, the institution of marriage is rather a means of assuring a stable family than of regulating the sexual life of its individual members. The ensuring to the children of membership of a closely knit and stable family is probably the prime reason for a society interfering with the freedom of its members to mate as they please. If, however, Unwin's hypothesis of the relationship of sexual regulation to cultural achievement is a true one, there is also the important result that this interference leads to an increase of social energy with consequences both desirable and undesirable.<sup>255</sup> If this is a result of social restriction of sexual activity, it has undoubtedly not been intended by the societies imposing these restrictions, but must be regarded as a by-product of prohibitions imposed for other reasons.

In many civilised countries at the present time, there is a tendency for pre-nuptial sexual freedom to increase. This has been justified both on the ground that trial matings before marriage increase the chance of a satisfactory choice of a life-partner, and also that the unresolved tensions resulting from sexual deprivation are a potent cause of neurosis. Both the impermanence of many marriages and the high incidence of neurosis are serious social psychological evils and any proposal which may have the effect

\* Thus the Trobriand Islanders would be as shocked at a mixed party of rambles eating sandwiches together as are the Christian missionaries at the Trobriand bachelors' houses at which unmarried young people sleep together

of lessening them deserves the serious consideration of the social reformer. The hypothesis of Freud and Unwin must, however, also be considered. Freud considers that the liability to neurosis is the price that civilised man must pay for his cultural advancement.

Another very important restriction imposed by societies on the sexual freedom of their members is the prohibition of incest and the requirements of exogamy. With certain exceptions (such as the royal families of ancient Egypt) brother-sister marriages are prohibited and also marriages with a large number of other persons who have certain relationships of kinship.<sup>207</sup> In some cultures, the people are divided into two exogamous *moieties*, of each of which any member can only marry a member of the other moiety. In others (as amongst many tribes of Australia) they are divided into four or eight *septs* and any male member of any one sept is required to marry a female of some particular one of the other septs.

There has been much speculation about the reason for these restrictions. The obvious explanation that primitive man was trying to avoid the evil genetic effects of inbreeding is now generally discarded, partly because the geneticists have pointed out that there are no necessarily evil effects of inbreeding and partly because any effects of inbreeding would be too long in appearing to be an effective check on incest. Requirements of exogamy do not prevent marriage between blood relations, since, even in a community divided into eight septs, the permitted wife may be a cousin. Less commonly a large community may be *endogamous*, no marriage taking place between one of its members and an outsider, although this restriction is a less binding one than those of exogamy. Endogamy is easily to be explained as a result of the tendency of social groups to become segregated. There is, for example, a strong tendency for different social classes and different religious bodies to form endogamous groups within our

own culture. Still stronger is the endogamous tendency amongst different racial groups within the same area. Thus the whites and blacks in the U.S.A. and in South Africa remain on the whole sharply distinct groups because there is a strong social pressure on the members of each group to choose a mate from inside that group.

Since all explanations of exogamy must be speculative, there is no reason why we should not add a new speculation. If members of small groups in a large society choose their mates from within their own small group, the result will be the segregation of each small group into a separate class. Such segregation is a source of weakness to the larger social unit of which these groups are parts. It is clear that exogamy will check this tendency to segregation and perhaps that is its essential social purpose. The segregation between different social classes in Great Britain would be much reduced if every peer were compelled to marry an actress, every professor had to choose his wife from domestic servants, and so on. This would mean that occupational classes would become exogamous groups instead of having a strong tendency to be endogamous. The greatest disunion in a society through the formation of segregated groups would take place if all families became segregated through always marrying their own members. This may be an explanation of the universality of the prohibition of brother-sister marriage. It also may be an explanation of the occasional relaxation of this prohibition (such as the brother-sister marriage of the Pharaohs), since in a ruling family social segregation is desired.

#### **4. Abnormalities of Sex**

In addition to the transformations of the sexual tendencies which are the results of social requirements, there are a number of spontaneous abnormalities both in sexual objects and in sexual behaviour. Such are:

*fetishism* (in which sexual feeling is only called out by some object or a normally indifferent part of the human body), *sadism* (in which it is called out by the infliction of pain, or by a phantasy of inflicting pain), *masochism* (in which sexual feeling shows similar dependence on pain inflicted on oneself), and *homosexuality* (in which the object of sexual feeling must be a person of the same sex). These abnormalities are generally called *sexual perversions*.\*

The sexual perversions produce a number of practical problems in social psychology, on the whole probably less serious than is commonly supposed. In all forms of sexual abnormality, all or a large part of the sexual energy of the individuals affected by them is drawn into other channels than the reproductive. This is not, however, in itself a serious matter since the total number of individuals affected is small compared with those whose sexual energies drive them to reproductive behaviour.

Social disapproval of any sexual abnormality tends to be strong. Less than a century ago, for example, sexual intercourse between men was punishable by death; the penalty is now ten years penal servitude. While there is no legal penalty against any homosexual behaviour which stops short of sexual intercourse, social intolerance of the mere disposition is also strong and is itself a practical social psychological problem.

There is no evidence that these powerful social and legal sanctions serve any useful purpose. Homosexuality is probably a condition partly determined by an innate predisposition and partly acquired. There is no reason for supposing that its frequency is lessened either by legal penalties or by social intolerance. In other countries, such as the Scandinavian, where social tolerance is greater,

\* This word unfortunately lacks the emotional neutrality desirable for a scientific classificatory term. Homosexuals, in particular, have a very reasonable preference for being described as "inverts."



it does not appear that the condition is any commoner. In some communities (as the Zuni Indians<sup>21</sup>) there seems to be complete social tolerance of homosexuality, and marriage between two men is a recognised social institution. Such marriages are relatively uncommon.

There are several different conditions in which sexual desire appears for members of the same sex. Some of these are only passing phases either of a particular stage of development (the *bisexuality* of the adolescent) or of the response to an abnormal social environment (the so-called *acquired homosexuality* which develops amongst men in barracks or prison camps when they are living in close contiguity isolated from women). The true homosexual has a lasting sexual preference for members of his own sex which persists after the bisexual stage of adolescence is past. True homosexuality exists amongst men in two forms. The commoner form is that of *object homosexuality* in which the active rôle in sexual relations is desired. In *subject homosexuality* the passive or feminine rôle is desired and there is often a noticeable femininity in physical appearance. This form may be innate;<sup>74</sup> object homosexuality is probably acquired in the same way as an obsessional neurosis (according to Freud as a consequence of abnormality of infantile emotional development). There is no reason for supposing that the incidence of either form is reduced in consequence of legal or social severity directed against homosexuality.

More serious are the social problems of a sexual abnormality which leads to behaviour of a very undesirable kind. A certain number of murders and probably a large proportion of the atrocities which occur during wars and revolutions are the results of the sexual abnormality of *sadism*\* or the taking of sensual pleasure in the infliction of pain. Many people with a tendency to this abnormality make a satisfactory sublimation of it or indulge it only in phantasy

\* There is an unfortunate tendency for those under the influence of Freud to use the word "sadism" for all cruel behaviour and even for all aggressive behaviour. That usage leaves us without a word for the sexual perversion in which cruelty gives sensual gratification, while applying the word we need to other types of conduct for which we already have suitable words.

and lead blameless lives. The tendency is, however, sufficiently common to be a real danger when, after a social upheaval, the persecution of a political minority is regarded as a public duty. Many of those who would otherwise have made harmless sublimations find themselves able to indulge their sadistic impulses freely against political opponents, and this freedom is used with results horrible both for their victims and for themselves. Tolerant understanding and psychotherapeutic treatment are as necessary to the person with sadistic impulses as to one with any other behaviour abnormality, but there is no social end the attainment of which can justify the release of the forces of sadism.

The social psychological problem of the sexual abnormalities is the same as that of all temperamental deviations from the common standard of a society. Every society has a certain pattern of approved behaviour. Individuals deviating through temperament or attitude from the approved form find a certain difficulty in fitting themselves into this pattern. If there is severe conflict between their own inclinations and the conduct socially required of them, the resulting stress may seriously affect their social efficiency and be an important factor in precipitating mental disorder. No society can have unlimited tolerance for deviations from its accepted pattern of behaviour. Our own society cannot for example tolerate such behaviour deviations as violence, murder, or rape, without sacrificing the reasonable ends of happiness and security for its members. The limits of a society's tolerance of deviations may, however, not be determined in reality by any such reasonable considerations. Widely developed hostile attitudes with strong emotional force may exist against socially harmless deviations. The real social problem is then not that of getting rid of the deviations but of inducing a reasonable measure of social tolerance of them.

## 5. The Parental Tendency

A system of drives which leads animals to care for their offspring is found almost universally amongst the higher animals and is not uncommon amongst the arthropods, insects, etc. The parental behaviour of different animals is, however, very varied. Some animals, such as the cuckoo, have no parental behaviour beyond that of depositing eggs in a place adapted to the needs of the young when they hatch out. Amongst some fishes, the parental tendencies are developed entirely by the male; for example, the male stickleback guards the nest and remains with the young ones for a short time after they are hatched, while the female has no concern with them at all after she has once laid her eggs. Amongst many kinds of birds, the function of sitting on the nest and caring for the young is distributed equally between the male and female.

Amongst human beings, the parental system of drives is generally supposed to be strongest amongst women. It is indeed very probable that it is only amongst women (and amongst them possibly only during the period after birth) that there is a strong system of parental drives resulting from internal secretions. On analogy with results obtained by Wiesner with rats,<sup>269</sup> it appears likely that lactation itself is not productive of this maternal drive, but undoubtedly the emotional experience of feeding the child at the breast increases the mother's tender attachment to it.

If we call this system of drives, the "maternal instinct," it must particularly be remembered that the part of maternal behaviour which is in any sense "instinctive" is simply the persistent energy which drives the mother to tender, protective, and self-sacrificing behaviour on behalf of her child. Her maternal instinct gives her no precise information about how the child's interests can best be advanced, nor any instinctive impulsion towards

the behaviour that is best for it.\* The mothers who kill their children by giving them unboiled milk from dirty vessels are moved by a maternal tenderness as real and as "instinctive" as that of the mothers who use the best methods of sterilisation. The driving force may come from an innate propensity, but the most effective means of attaining the ends of the parental behaviour tendency must be learned.

Parental love does not, of course, depend entirely on the strong drives which exist in the mother soon after birth. These form the foundation for sentiments of parental love which remain powerful sources of energy. Although it is only in the mother that this physiological foundation exists, parental tenderness may also be strong in men. It may be indeed an accident of the form of our pattern of culture that love of children is very commonly attributed to women only.† In our civilisation, care of children is commonly undertaken exclusively by women, but this is not true in all cultures. In the Trobriand Islands, for example, the father takes care of the children after weaning, and their later debt of gratitude to him is regarded as his reward for taking them in his arms and for cleaning them when dirty.<sup>163</sup>

The parental tendencies have always been admitted as sources of altruistic modes of behaviour and of disinterested emotion. Hobbes, for example, who denied the innateness of the social tendencies in man, admitted the

\* Such instinctive direction of maternal behaviour certainly is to be found lower in the animal scale. Yerkes reports, for example, an orang-utan mother who, when her newly born child had difficulty in breathing, performed the correct action of inflating its lungs by breathing into its mouth.<sup>288</sup> This may have been instinctive, but few human mothers would have solved this problem without having been told what to do.

† In support of this view, Margaret Mead has shown that amongst the Arapesh people of New Guinea whose pattern of culture does not standardise this sex difference, there is no difference in the amount of parental tenderness shown by mothers and fathers.<sup>290</sup>

existence of altruistic behaviour as an original response within the system of parental behaviour.<sup>101</sup> It must be admitted that altruism appears most strongly as a parental response but it is not confined to the parental situation. Even if it originated as a parental response, it is now certainly extended to social groups larger than the family, and can, therefore, properly be treated as social behaviour.

## **6. Behaviour Tendencies of the Child in the Family**

It is curious that those who have classified human instincts have generally distinguished a mating instinct and a parental instinct but no filial instinct. This may be because they thought that there was no innate factor determining the relation of child to parent, or it may be because this relationship seemed to them to be relatively unimportant. The credit of rescuing from neglect the problem of the child's relations to its parents belongs to Freud, and his treatment of this subject forms the central core of psycho-analytic theory.<sup>83</sup>

The conception to which Freud attaches the most importance is that of the so-called "Oedipus complex"—the system of emotional attitudes of the small boy towards his parents which includes a passionate and jealous love for his mother (a love which, according to Freud, is sexual but not yet genital) and also the opposite attitude of hatred for the father as his rival for the mother. After a latent period from about five to adolescence, a new phase of sexuality appears in which it begins to take the adult form of genital sexuality and seeks for an object outside the family circle. At first relatively indifferent to the sex of the love-object (who may be as much as twenty years older than the adolescent himself), this new form of the sex tendency afterwards typically becomes centred on a member of the opposite sex of an age not very much different from the youth's own. The love life

of girls is supposed to follow a similar course, an Electra love being formed for the father, but the matter is complicated by the possibility of an alternating passionate love for the mother with jealousy of the father.

It has been stated that the stage of love for the parents is of importance in future life in the following ways. First, neurotic patients very commonly show evidence of a failure to pass beyond the stage of passionate love (and hate) for the parents to that of love for an outside mate, and many of their peculiarities are due to the repression of an Oedipus complex. Secondly, the kind of mate chosen is stated to be influenced in various ways by the character of the parent whose place he or she is to take. Thirdly, attitudes towards religion and towards those in authority are said to be largely determined by the earlier emotional attitude towards the parent; thus a man may be conservative because his early respect for his father is transferred to the king or other person in authority, or a revolutionary because his early attitude of rebellion against his parents is transferred to these parent substitutes.

For the first of these statements there is much evidence obtained in the course of psycho-analysis of psycho-neurotic patients. Although it is difficult to assess the exact scientific value of such evidence, it is sufficiently impressive to make the conclusion a very probable one. The other two rest on anecdotal evidence. Both seem very likely to be true, but only a careful statistical enquiry could be a satisfactory demonstration of their truth.

Earlier than this stage of passionate devotion to either or both parents, Freud distinguishes a stage in which the "sexual" impulses of the child are directed in ways similar to those of adult sexual perverts. This he calls the stage of "polymorphous perverse sexuality" and he believes that the adult sexual pervert is simply one whose sexual impulses, while having the adult character of genital sexuality, have otherwise reverted (or "regressed") to some phase of this early infantile stage.

Thus the young child biting at the breast is said to be "sadistic," and the adult sadist is showing the abnormality of obtaining sensual gratification in a way which was normal to him in very early childhood.

If this cannot be regarded as a final statement of the emotional development of the child in the family since it obviously requires restatement and exact scientific verification, it is probably the best guide to this problem that we have at present. In trying to assess its scientific value, we must avoid the error of attaching undue weight to purely verbal questions. The use of such terms as: "infantile sexuality," the "Oedipus complex," "sadism," are open to obvious objection since all are likely to be misunderstood as implying a maturity of sexual development which no one supposes to exist in the young child. When Freud speaks of "sexuality" in young children he means an emotional attachment similar to and continuous with the sexual love of the adult. But there is also something discontinuous in sexual development and the new element which comes in at adolescence is indicated by Freud as "genital sexuality." Whether we shall call the stage started at adolescence "genital sexuality" or "sexuality," and whether we shall call what precedes it "sexuality" or "non-sexual affection," is plainly a verbal question. Whichever usage we adopt, we must admit that there is both an element of continuity and of discontinuity between the adolescent and the pre-adolescent affections. If, however, we wish not to be generally misunderstood, it will plainly be preferable not to use the Freudian terminology.

This danger of misunderstanding might be avoided while the idea of continuity was emphasised by coining a new phrase for the child's early love tendencies. I suggest the term "proto-sexuality." Similarly, we might use the term "proto-sadism" for those aggressive impulses of the young child called "sadistic" by Freud. This term suggests what is really meant by Freud, not that

the impulses are identical with those of the adult sadist, but that they are the primitive dispositions out of which adult sadism may develop.

It must be remembered that the characteristic course of a child's emotional development in the family situation may be less an unfolding of an innate propensity than a response to the particular family situation in which he finds himself. The typical family described by the Freudians is generally one in which the mother is the tender protector and the father a stern disciplinarian.<sup>207</sup> But not all mothers are tender or all fathers stern. Malinowski has pointed out that in the Trobriand Islands, the father has only tender relations with his sons and the mother's brother is the disciplinarian. Amongst these people, the "Oedipus complex" takes a characteristically different form, hate reactions being directed against the mother's brother and not the actual father. Equally wide differences in the family situation exist within our own culture, and the typical family of the Freudians is only one of many forms of the family situation. A full knowledge of infantile emotional development will necessitate a comparative study of the effects of different family environments.

Many important practical questions are raised by this view of the emotional development of the child. What family situation best fits the child for the kind of social reactions which he will later require? To this question, the psycho-analysts have not yet given any certain answer. There are obvious suggestions of dangers to be avoided. If it is true that a sentiment of hate may develop against one parent, it is obviously undesirable to intensify that tendency. Particularly the analysts of children have found that the observation of sexual intercourse between the parents is likely to have bad effects on emotional development.<sup>128</sup>

Are there similar dangers from the undue intensification of the sentiment of love for either parent? It is now very generally supposed that this may be undesirable since it may make more difficult the later step of transferring love to a future mate,



and many mothers are afraid of expressing their maternal tenderness by fondling their children lest they should create in them a too powerful "Oedipus complex". This fear has not, I think, been endorsed by Freud himself, but by those who have popularised and misunderstood him. It is doubtful whether a normal woman, whose love-impulses are sufficiently satisfied in her sex-life and whose tenderness for her children discharges itself in considerable part in the work of taking care of them, will be tempted to indulge in the physical caressing of them to an extent that could be harmful to them.

Some modern parents (partly through the influence of the writings of J. B. Watson) have supposed that all caressing of children is harmful and that consideration for the psychological well-being of their children requires them to abandon it. For this opinion there seems to be no good reason. The caress plays an important part in stimulating love both in sexual and parental activities. It is a complete misunderstanding of Freud's opinion to suppose that he regards strong love between parents and children as harmful. Indeed he would seem to regard it as essential to satisfactory emotional development. Freud is quoted as having said in conversation: "The function of the mother in the life of her son is to teach him how to love." The modern parent who never fondles her (or his) child in the hope that the child will thus be safeguarded from the danger of a fixation of the love impulses in their infantile stage of attachment to the parent, would appear rather to be imperilling the child's capacity to form a strong and lasting attachment when it has grown up. Exactly what is the result to be expected from refusal to follow the normal parental impulse to caress children, must, of course, be a speculation, but the result here suggested seems a very likely one. It must be borne in mind also that the child analysts find that children frequently suffer from anxiety lest their parents should not love them and may need the reassurance which the physical expressions of love can give them.<sup>129</sup>

## CHAPTER X

### ACQUISITIVENESS AND PUGNACITY

#### 1. Acquisitiveness amongst Animals

It has been very often noticed that a dominant motive behind conduct in modern civilised societies is the tendency to acquire wealth or its equivalent in money and to retain it. This fact has sometimes been regarded as one to be deplored and remedied,<sup>283</sup> sometimes as an inevitable part of human nature which the economist or sociologist must take account of without making futile attempts to alter. It becomes, therefore, important to attempt to discover how far this acquiring and retaining behaviour is rooted in an innate "instinct" or "acquisitive propensity" and how far it is an attitude acquired as a result of the high social valuation of material possessions and of the acquisitive attitude towards them.

It is convenient to use the term "acquisitive tendency" to cover both the behaviour of acquiring goods in excess of immediate needs and that of retaining or hoarding them, but not the behaviour of acquiring an article for immediate use. Thus a dog burying a bone may be said to be showing acquisitive behaviour but not a dog helping himself to a piece of meat which he is going to eat immediately afterwards. Evidence as to whether human acquisitiveness is based on a tendency that is innate might be drawn from its appearance in the animal world, from its appearance as a play activity in childhood, from its appearance as a crude and ungraded tendency in mental disorder, or from the universality of its appearance amongst all races of mankind. Let us see what these different lines of evidence have to contribute to the solution of the problem.

Amongst animals we find hoarding, primarily of food for future consumption. Examples are to be found in the hoarding of honey by the bee and the burying of bones by the dog. The biological purpose of these examples of hoarding is obviously the provision of food for future use, but it should be noted that bees store honey in quantities beyond their needs for the winter, and dogs bury bones when there is no shortage in the supply of them. These facts suggest that behind such conduct there is a specific drive to hoard and that this is not merely an adaptation of the food-seeking tendency to a condition of seasonal shortage of the food supply. This conclusion is more strongly borne out by such acquiring of useless objects as is reported by the observers of the conduct of jackdaws and magpies.

Most striking in its apparent resemblance to a part of human behaviour is the acquirement of territory by male birds before the nesting season. H. E. Howard has made a valuable study of this tendency of male birds of various species to acquire a territory and to fight any male of the same species who ventures to intrude in it.<sup>104</sup> The song seems to serve the purpose of warning other male birds that the territory has been acquired and of letting the female know that a male bird is there under the conditions necessary for pairing.

This territory sometimes extends (like that of the cuckoo) to several fields, while the guillemot requires only a few square feet of rock. The territorial acquisition serves, in ways differing with different species, the ends of the reproductive tendencies. For example, such birds as the chaffinch require a speedy supply of food drawn from a small area so that the old birds and the young may be adequately fed without any danger of so long a desertion of the nest as might cause destruction of the young by cold.

A point of particular interest in these observations is the alternation in the male bird between behaviour in which he is gregarious, and behaviour in which he insists

on this isolation. During the winter he moves about as a member of a small or large group, showing no hostility towards other males, and no particular interest in females. Then, at the beginning of the breeding season, he leaves the flock and establishes himself on an area of ground, on which he tolerates no intrusion either by other individual males or by the remainder of the flock. At the same time, he may for intervals desert his own territory and repair to the neutral ground occupied by the rest of the flock, and show his old friendly attitude towards other members of it. Howard, therefore, concludes that the situation calling out pugnacious behaviour is the standing in his own territory and not merely the development of the sexual organs which takes place at this time.

It should be noted that the territorial behaviour of birds serves the ends, not of the self-preservative but of the reproductive system of tendencies. Similarly, the normal springs of a man's acquisitive behaviour are the needs of his wife and family, and purely self-motivated acquisition is relatively abnormal.

Thus we find analogies to man's acquisitive behaviour in the instinctive behaviour of certain animals. This leads us to the conclusion that there is amongst some animals an innate acquisitive drive, or "instinct of acquisition." This observation does not, however, lend much support to the view that man's acquisitive behaviour is also determined by an innate propensity when we notice that the acquisitive drive is not very widespread amongst the animals and that the examples we have found of it are not amongst near relatives of man. There seems to be little if any acquisitive or hoarding behaviour amongst the higher apes. This last fact is not conclusive against the possession by man of an innate acquisitive propensity, since it is conceivable that this is a difference between the inherited constitution of man and of the apes. Man might owe his cultural superiority over the gorillas, chimpanzees and orang-utans, partly to the fact that he is an

ape with a highly developed innate acquisitive propensity which they lack.

## 2. Acquisition in Man

The study of animal behaviour gives, therefore, little support to the view that man has an innate tendency to acquire and to hoard. We may next consider what evidence is to be derived from the study of man himself. The early and persistent occurrence of a line of behaviour as a play tendency in early childhood is one piece of evidence (although by no means conclusive) that the behaviour in question is the product of an innate drive. We find, in fact, that acquisition and hoarding start early amongst children. The psycho-analysts state that the earliest objects collected are excreta and that, as children are discouraged from this, they collect harmless but generally useless objects such as stamps, cherry-stones, beech nuts, etc. Later, this tendency is satisfied by wealth of all kinds (but particularly by the accumulation of money), although they may carry over into adult life the comparatively useless acquisitiveness of childhood and collect china or stamps.

The forming of useless collections is found as an accompaniment of certain forms of insanity (*e.g.* dementia praecox). Excreta also may be collected and treated as objects of value, being given, for example, as a present. In these phenomena, the behaviour of acquisition is showing the regression to an infantile form characteristic of the progress of dementia.

On the border line between the sane and insane manifestations of this tendency we find the miser. He collects the same object as normal persons—wealth in the form of money—but his acquisition has lost its relation to the primitive needs of food, etc., for it is relatively ungraded, and his real biological needs may suffer in the pursuit of it. There seems to be good reason for regarding the miser's

to be too firmly rooted in psychological literature to be replaced.

The importance of repression in psychology (and particularly in psychopathology) lies in the fact that it has been claimed to be the root cause of many mental disorders, certainly of the psycho-neuroses, possibly also of some of the psychoses. From the point of view of consciousness a repressed system may appear to be converted into its opposite. A sentiment of love repressed may give rise to a conscious aversion to the person loved. A strong tendency to pugnacity, similarly repressed, may give rise in consciousness (and in actual behaviour) to a peculiarly strongly developed tendency to meekness. In these cases, what is appearing in consciousness and in behaviour is not the repressed sentiment but the system by which it is repressed. Such a replacement of a repressed behaviour tendency by its opposite is called *compensation*.

Part of the psycho-analytic cure for a psycho-neurotic is the redirecting of his repressed energy into a socially desirable channel. To this process, Freud has given the name *sublimation*.

#### 4. Deflection

Sublimation is a special case of the more general process of finding a substitute outlet for a suppressed drive. For this general process, we may use the word *deflection*. The psycho-analytical use of the word "sublimation" is for a socially desirable deflection. Thus Freud says: "They [the sexual forces] are . . . sublimated, that is to say, their energy is turned aside from its sexual goal and diverted towards other ends, no longer sexual and *socially more valuable*"<sup>83</sup> (The italics are mine.)

It is clear that the introduction of a judgment of social value into the definition of a term makes that term of doubtful validity in scientific psychology. A deflection is not of essentially different psychological nature by being

that the Melanesian attitude towards property is correctly described as simple communism.

It is probable that neither in Melanesia nor anywhere else, is it possible to find an organisation of society which can correctly be described as "primitive communism" in the sense that the typical acquisitive behaviour of retaining goods as individual possessions is completely absent. The important point of Rivers' observations, however, remains. A culture may exist in which this type of behaviour is so little developed that our own kind of acquisitive behaviour would seem to its members to be altogether irrational. It is not possible to claim that there is such uniformity of acquisitive behaviour of men living in different cultural environments as would in itself be evidence for the existence of an innate acquisitive propensity. Lack of uniformity in acquisitive behaviour is not, of course, evidence against an innate acquisitive propensity, since it is possible either that such a propensity exists in different strengths in different racial groups, or that the strength of acquisitive behaviour depends primarily on environmental influences (on the social production of acquisitive attitudes) and not on the strength of the acquisitive propensity. If the latter explanation were accepted, the statement that there is an innate acquisitive propensity would be true but of little importance as a principle of explanation in social psychology.

It is, of course, obvious that a great part of the behaviour of seeking and retaining wealth can be explained without assuming any specific drive to acquire, since such behaviour may be explained as due to the operation of other more familiar drives. If a hungry man makes efforts to acquire a loaf of bread, his behaviour is sufficiently explained by the food-seeking drive and needs no reference to a specific tendency of acquisition. If he makes efforts to earn a weekly wage his activity may be explained in the same way. The earning of the wage is an indirect way of getting food for his wife and family and satisfying

his other needs. If he makes efforts to earn money more than is necessary to satisfy his primary needs this may be explained as due to his wish to satisfy other wants—for motor cars, wireless sets, wines, etc. When we notice that he makes efforts to earn more money than he requires either for needs or for luxuries, and that he does not spend it on goods but puts it into a bank or invests it, we may explain this behaviour by saying that the end he is trying to obtain is future security for himself and for his family.

No one would deny that this account of the activity of acquiring money is very largely correct. The incentive for the acquisition of money is very largely the satisfaction of primary needs, the desire for luxuries, and the obtaining of security for the future. Many economists consider that this picture of the motivation of acquisitive behaviour is a complete one. It gives a pleasantly rational account of economic behaviour, but there are many things that it does not explain. It is not the case that the intensity of money-acquiring behaviour commonly falls off as the earliest needs are satisfied and that it sinks to zero when the man has a reasonable number of luxuries and adequate security for the future. On the contrary, the effectiveness of the earning of money as an economic motive depends on the fact that the intensity of effort to acquire it does not fall off as more is acquired. It is a want that is generally insatiable. The full-fed animal or man ceases to make efforts to obtain food, but the wealthy man does not cease to make efforts to obtain money.

This insatiability of acquisitiveness is true not only of money but also of possessions generally. The primary need for shelter is satisfied by a very small house, but men acquire large houses and large estates and numerous objects to put in their houses for the same reason as they acquire large banking accounts—because these things have themselves incentive value and are not merely sought as means to the satisfaction of some other need. It is this insatiable character of the demand for possessions that makes



it necessary to postulate a special tendency to acquire and retain possessions which we may call the "acquisitive tendency." The mere fact of insatiability does not, however, prove that this tendency is inborn; it does not, in itself, justify us in talking of an acquisitive instinct or propensity.

We spoke earlier of the miser's acquisitive tendencies as being unrelated to his primary needs. From what has been said above, however, it is clear that this is only a difference in degree between the miser and the normal man. Most people in a civilised society have an acquisitive tendency which is in part unrelated to their primary needs. The miser may starve himself so that he need not part with his money, but many other people deny themselves present pleasures and even present necessities in order to save money, not because they have reflected that they need the money for future security but because the impulse to save it is stronger than the impulse to part with it. A further characteristic of the miser is that the object of his acquisitive impulses is normally money and not goods. This also, however, is only an extreme manifestation of a characteristic present in all acquisition. For most people, money has an incentive value for acquisition peculiar to itself.

Unquestionably there are individual differences in the strength of the tendency to acquire and retain money and other possessions. The man of business who has supplied the economists with the typical "economic man" may be one whose acquisitive tendency is relatively strong and persistent in its driving force even after the primary biological needs for food, shelter, etc., have been satisfied. If he is intelligent and fortunate, and has canalised his acquisitive tendencies into those activities which are permitted by the society in which he lives, his efforts will be rewarded by the success of his acquisitive aims.

There are other men whose mental energy is mainly directed through other channels (such as scientists,

engineers, explorers, religious persons, etc.) and some whose acquisitive tendencies are satisfied in other ways than the acquiring of wealth (such as collectors). These show relatively little tendency to make great efforts to acquire wealth further than is required for their needs. It is probable that economists have erred in their estimation of human motivation by taking the successful business man as the representative individual in this respect and attributing to other persons the same strength of acquisitiveness with less ability to satisfy it; whereas it seems more probable that the business man has as a dominant element in his character the acquisitiveness which is comparatively subordinate in others.

There seems to be no sufficient reason for asserting that these differences in strength of the acquisitive tendency are due to differences in strength of an innate propensity. They may be due to differences in the strength of the social influences by which acquisitive attitudes have been built up. The child finds himself surrounded by objects which are "owned" by his parents and other people and finds his rights restricted with respect to them. At the same time there are other objects in which he finds himself invested with similar rights. He grows up in a world in which a possessive attitude is socially permitted and encouraged. Later he recognises the social approval which is given to those who have successfully attained the aims of acquisition; he hears that one man has "made good," i.e. that he has acquired money and a large house and a motor car, while he notices the little respect that is paid to one who has failed in this object. There are thus a number of social influences at work in building up acquisitive attitudes. The differing intensity of these influences in different individual's social environments might account for differences in strength of the acquisitive tendency.

It seems unlikely, however, that these are the only factors that determine the child's development into a more

or less acquisitive individual. The ease with which children adopt hoarding habits, the persistence of these habits in spite of parental discouragement, and the tendency of indiscriminate hoarding to reappear as a symptom of mental disease all arouse the suspicion that the acquisitive tendency is not merely an acquired attitude but is based on an inborn propensity.\*

If there is such an original tendency to acquisition, it acts merely as a foundation on which acquisitive attitudes are built. If we wish to understand the acquisitive behaviour of an adult man, it is less important that we should guess that he started with an acquisitive propensity than that we should know the social forces which have built a system of acquisitive attitudes on this foundation. These social forces have canalised his acquisitive tendencies and have probably very much intensified them. The canalisation is seen in the social and legal distinction between legitimate industrial enterprise and theft. A man may acquire money by selling for five shillings a patent medicine which cost him twopence to make but not by removing money from another man's purse. Legal penalties and social disapproval are strong in opposition to theft because theft is the breaking beyond permitted bounds of a behaviour tendency which our society encourages and utilises.

Living under a different pattern of society our acquisitive tendencies might be less strong and canalised into altogether different channels. In Russia at the present time, there is the same sort of social disapproval of the activity of a man acquiring an individual fortune by commercial activity as amongst ourselves of him acquiring wealth by theft or piracy, and there is no reason for supposing that such a social requirement does any more

\* Or on a very early transformation of some other tendency. This is the psycho-analytic explanation of acquisitiveness, that it is the transformation of the early interest in and valuation of excreta. Such a mode of origin of a tendency would be difficult to distinguish from an original innate propensity.

violence to man's inborn nature than is done by the prohibition of theft. Both requirements are social restrictions on the development of a tendency which probably is based on an inborn propensity. The development of human attitudes and behaviour tendencies is certainly very variable when acted on by different social requirements. The central error of the popular use of the instinct psychology is the ignoring of this variability. It is true, of course, that for any social and economic activity to take place, a social setting must be provided which gives an adequate motivation for the required activity. It is a mistake, however, to suppose that the system of motivation to which we are accustomed is the only possible one.

### 3. Pugnacity amongst Animals

McDougall has included the response of anger and aggression in his list of innate human propensities. There is little doubt that the tendency to angry, aggressive, or pugnacious behaviour is inborn, although (as in all human behaviour tendencies) the details of adult aggressive behaviour are learned responses, the situations calling out aggressive behaviour are acquired in a manner analogous to the conditioning of a reflex, and the strength of the tendency in any individual, although probably partly determined by inborn temperamental factors, is also partly the result of educational and other social influences. We can best approach the problems of human pugnacity by first studying the fighting behaviour of animals.

Fighting-play is an activity which is found among the young of a large number of animals. The most usual kind of activity amongst puppies is playful fighting, which occasionally degenerates into struggles of a more serious kind. Groos has pointed out that such playful contests are found amongst animals which are not aggressive towards members of other species, as well as amongst

the beasts of prey.<sup>92</sup> If we accept his theory that play is rehearsal for the serious activities of adult life, it seems to follow that such play is essentially a preparation for adult fighting between animals of the same species and not merely for aggression against other species.

Such fighting between adults of the same species is a phenomenon widespread in the animal kingdom. It has been very generally supposed to be connected with sexual activities. Some writers have thought that the subjugation of the female by the male primitively takes the form of a contest, and that courting is a later refined substitute for the crude physical combat.<sup>71</sup>

A form of contest which has been more generally regarded as of importance, however, is the struggle between males of the same species for the possession of the female. These struggles are common about the mating season; the female is supposed to give herself to the victorious male. The prevalence amongst some male animals (*e.g.* stags, cockerels, etc.) of fighting weapons not found in the female suggests that these kinds of fighting may have played a part in the evolution of some species. It may be doubted whether the courting combat is ever of much importance, but there is no doubt that the struggle for the female, as described by Groos and Darwin, is one of the fundamental expressions of pugnacity amongst animals.

There are, however, other kinds of fighting which clearly possess no sexual significance. As an instance, we may take the combats between cows for leadership, described by Baud-Bovy.<sup>18</sup> This struggle takes place each year in the pasturages of Thion towards the end of June or in the first days of July, when the herds arrive on the high pasturages. It has great practical importance, for the victorious animal is recognised (not only by the herdsmen, but by the cows themselves) as "queen" of the herds. The queen, whose functions last during a whole year, has the privilege of walking at the head of the herds, and this

privilege extends even to the herd to which she belongs. This herd goes before the others, and so gets the best of the pasturage.

On July 2nd, 1902, M. Baud-Bovy saw the fight at Thion. "From all sides," he writes, "appear the herds; the cows, with extended muzzles and tossing heads, emit violent and unwonted bellowings. In order to avoid too serious injuries, the horns of the cows are slightly blunted. . . . Soon rapid engagements have taken place; young beasts who had over-estimated their strength, after some unfortunate encounters, have retreated humiliated to the ranks." One magnificent cow overcame three adversaries in turn. After each victory, she bellowed until some other hitherto victorious cow answered her challenge. These were also defeated by her or retired without fighting as if sure of defeat. Finally, she engaged the queen of the previous year, and threw her on to her knees. After showing a little more resistance the old queen was driven from the field and the victor was left alone, proudly throwing out anew her challenge.

Howard maintains, moreover, that fights amongst birds are not dependent on the presence of the female, but are normally for territory.<sup>104</sup> They are practically absent when the birds are together in the gregarious condition in the flock. A fight takes place when another bird settles on territory which has been appropriated already, and the fight is abandoned when he is driven off. Generally a male is fighting a male, but a male and female together may fight another pair, or a male and female together may attack a single female, or even a single female may be seen to attack another female. Sometimes the male will engage one by one the individuals of a flock which has landed on his territory. Fighting also often occurs between members of different species brought into competition by requiring the same nesting conditions: for example, the raven and the peregrine or buzzard; the moor-hen and lapwing, thrush, or starling; magpies and wood pigeons, etc.

#### 4. Aggressive Behaviour amongst Children

Aggressive impulses are found very early amongst children. Some observers consider that the infant biting at the breast is showing the first aggressive behaviour. Very early the emotional behaviour pattern of anger with kicking and random striking with the hands is a characteristic response to restriction. Not much later, the same pattern of response is found in the temper tantrum which it is difficult to attribute to any particular kind of external situation. Before the end of the first year, definite blows may be directed against a person who has removed a desired object or given other cause of offence. Blows may be exchanged between children in a more or less earnest fight before two years of age. It is noticeable, however, that fighting play is found much less amongst children than amongst such animals as puppies. Groos states that it is rarely found before three years of age.<sup>92</sup> A great part of the fighting between older children, however, is apparently an activity pursued for its own sake and not with the object of injury to others or the possession of an article fought for. It has, therefore, some of the character of play even when it is earnestly pursued.

These relatively playful contests grade into others of a more serious nature which, although very often entered into for the enjoyment the activity of fighting itself brings, end as serious fights in which real injury is done. A desire for domination appears to be at the root of these children's fights. Bovet points out that teasing is an activity of children which is obviously closely related to the fighting tendency.<sup>93</sup> Children he says, do not fight because they are teased; they tease in order that they may fight. Sometimes, however, teasing, instead of leading up to a contest, is substituted for it. This and other transformations of primitive pugnacious behaviour tend to take place when an improvement in manners causes the child to look unfavourably on actual physical fighting.

### 5. Fighting amongst Human Adults

The close association between fighting and sex observed amongst the animals is found also amongst human beings. Domination of the female by violent behaviour has sometimes been suggested as the primitive form of the marriage ceremony, but the researches of Westermarck seem to have placed beyond doubt the fact that the so-called "marriage by capture" has never been more than an unusual development from peculiar environmental conditions.<sup>268</sup> Fighting between men for the possession of women has, however, been more common. The tournaments of the middle ages took place in the presence of women, and often the prize was the possession of a woman. The more highly modified forms of pugnacious behaviour to be found in present-day competitive games are in a certain measure (although not entirely) displays for the benefit of a feminine audience.

Such contests have played an important part in the marriage customs of some peoples. Westermarck gives examples from Paraguay, California, Australia, and Papua.<sup>269</sup> He quotes the following passage of Hearne about the Northern Indians: "It has ever been the custom among these people for the men to wrestle for any women to whom they are attached, and, of course, the strongest party always carries off the prize. A weak man, unless he be a good hunter and well-beloved, is seldom permitted to keep a wife that a stronger man thinks worth his notice. . . . This custom prevails throughout all their tribes, and causes a great spirit of emulation among their youth, who are upon all occasions, from their childhood, trying their strength and skill in wrestling."<sup>270</sup>

Actual physical struggles without sexual significance are, of course, also found amongst men. Men may quarrel about any object they value as well as about the love of a woman (or merely for the satisfaction of their self-assertion). Except for the highly conventionalised combat of the duel, however, these disputes do not



generally lead to actual physical fighting amongst civilised men except under conditions of regression to primitive modes of behaviour. Such regression takes place sometimes under the influence of alcohol, and drunken men often fight readily. A similar regression appears to take place after severe hardship, such as occurs during an exploration. Without any stimulus from feminine onlookers, explorers appear to quarrel amongst themselves about trivial things in a manner remarkably contrasting with the peacefulness of their behaviour under ordinary conditions. A similar quarrelsomeness has been observed in experiments on the effects of deprivation of oxygen. This is a matter which requires further research.

## 6. War and the Aggressive Tendency

When people speak of a human "instinct of pugnacity" they very commonly mean an inborn tendency for one social group to make war on another. There is, however, no reason whatever for supposing that this is a primitive and inborn mode of behaviour. Many vertebrate animals show more or less aggressive behaviour towards other members of the same species but none show the behaviour of two social groups endeavouring to exterminate each other. The only animals amongst which war has been observed are the ants. The slave raids of such ants as the Amazons closely resemble a certain type of human war. Also it is sometimes found that two neighbouring ant nests of the same species will engage in a communal fight in which vast numbers of ants are killed. This, however, seems to be the only development of this kind of behaviour amongst the animals and to be dependent on the extreme development of the social instincts found amongst the social insects and nowhere else in the animal world.

Nor is there any ground for saying that warfare has always and everywhere been present amongst human

societies. Perry has pointed out that food-gathering communities in the primordial state were peaceful and that cruelty and violence were rare.<sup>180</sup> Warfare was an acquired habit which resulted from the circumstances of the development and decay of the archaic civilisation. The peoples of Egypt, Babylonia, etc., underwent a progressive education in violent modes of behaviour, which began with the hostility between two sides of the dual organisation. Militias became standing armies, and human sacrifice developed. He also points out that people in the food-gathering stage at the present time are peaceful, and that the education of a peaceful people in violent modes of behaviour has taken place recently in Fiji and elsewhere.

Warfare must not, therefore, be itself regarded as a primitive expression of the aggressive tendency. It is a re-direction of that tendency into an activity which is not itself primitive for the attainment of economic or other ends of a social group or of its leaders. It will hardly be doubted that in primitive warfare with hand-to-hand fighting the combatants are exercising their aggressive tendencies, and that by fighting they obtain a mental satisfaction whose absence in times of peace is shown by restless discontent and desire for active service. But in modern warfare the conditions have so changed from those of the primitive battle that, for effective soldiering, the aggressive tendencies of the individual soldier must already have undergone considerable transformation. He may get a fierce primitive satisfaction from occasional hand-to-hand struggles, but more often he is engaged in some manipulative activity which has no immediate connection with killing the enemy, or in long periods of simple inactivity. Throwing bombs from aeroplanes, performing the mathematical calculations necessary in modern gunnery, or standing for weeks or months inactive in a trench, are kinds of behaviour far removed from that of primitive pugnacity.

Although war between nations may appear to be advantageous from the narrower point of view of a single

national group,\* there can be no doubt that, from the wider point of view of the race as a whole, it is an evil too serious to be tolerated. By an inversion of ordinary natural selection it takes its victims from among the most fit; its damage to life and wealth are such that it is doubtful whether total destruction of Western civilisation will not result from a continuance of the appeal to arms for settling international disputes.

There are many obstacles to the abolition of warfare but the existence of an instinctive tendency to go to war which can obtain satisfaction in no other way is not one of these obstacles. The very great difference between the activities required by modern warfare and those of primitive aggression is probably one of the reasons for the increased sentiment against war at the present particularly amongst those who had the experience of combatant service during the war of 1914. It is arguable that non-combatants obtain satisfaction for their aggressive tendencies on an ideal plane even in modern warfare, so that attitudes in favour of warfare are more easily developed amongst them. This is probably true, but it is likely that the next war will be as psychologically unsatisfactory for the non-combatant as for the combatant. The wearing of gas-masks and taking refuge in gas-proof rooms from bombs dropped by an enemy against whom one can take no action is less satisfactory to the aggressive impulses than the reading of accounts of battles and the imaginative participation in them. The next war is likely to give little satisfaction to the primitive aggressive impulses of either combatants or non-combatants.

There are, of course, psychological factors favouring the continuance of war. These, however, are not innate propensities but attitudes favourable to war built up partly as a secondary result of attitudes of national loyalty and

\* Even this is more than doubtful. The economic and biological loss of the victors in the late war (even apart from the load of mental and physical suffering which it entailed) far outweighed their material gains.

hatred of other national groups, partly by social approval of warlike activities and of those who take part in them. Such attitudes are, at the present time, very strong because warfare is a recognised mode of social activity. There is no reason for doubting that if war were renounced by the civilised world, other attitudes would be built up and other outlets could be found for men's aggressive tendencies.

The practice of head-hunting among the Papuans was at one time an important element in their culture, for manhood was attained by the youth who had brought back the head of a member of a hostile village. When he had done this he had the status of manhood and was able to marry. Mere suppression of head-hunting by the authority of their British rulers was found to lead to a degeneration of the villages, for none of their youths attained manhood, and they could produce no socially recognised certificate of courage which would lead their women to love them. This difficulty was got over by the institution of bringing back a wild boar's head. This required from the young men no less strength, skill, and courage than the old custom of obtaining a human head, and its adoption as the condition for initiation into the state of manhood was no less successful than the older one, and no less satisfactory to the women who needed evidence of manhood and courage. So social degeneration was prevented by this simple expedient of making wild-boar hunting a "cultural substitute" for head-hunting. It should not prove an insoluble problem for sociology to devise a "cultural substitute" for the practice amongst civilised races of requiring their young men to prove their manhood by the method (equally wasteful in social values) of killing the young men of other civilised nations with bullets and high explosives

There is, in fact, no lack of ways of employing these impulses in a manner beneficial to society as a whole. Ignorance, disease, and vice are enemies demanding all the self-sacrifice, courage and determined pugnacity, which are at present poured out in the socially useless activity of soaking the earth in blood. A German opponent of militarism wrote truly in 1913: "Every individual who acquires the soldier's mind in his youth is a warrior lost for the struggles of the spirit."<sup>274</sup>

## 7. Transformations of the Aggressive Tendency

Aggressive behaviour in its most primitive form of mere individual quarrelsomeness is obviously a disposition socially harmful. Success in carrying on life under conditions of complicated inter-dependence between individuals necessitates some other method of settling individual disputes than resort to violence, and some other satisfaction of man's disposition to pugnacity than by doing physical injury to his fellows. Resort to the law-courts for the settling of disputes is one way by which primitive pugnacity is rendered unnecessary, and, where the provision of this alternative method of obtaining satisfaction is sufficient to stop men from resorting to physical violence, the law also steps in to punish regression to the cruder primitive way of settling disputes.

We have seen that Hobbes imagined that the primitive condition of mankind was a war of every man against every other man, and that a stable social organisation was only obtained by the suppression of this condition by legislation \* While this conception of a primitive anarchical war is certainly a fiction, it remains true that a stable social condition can only result from the suppression, canalisation, and transformation of individual aggressive tendencies. This is well illustrated by the total collapse of a social group which may result from the outbreak of individual pugnacious tendencies from their accustomed suppressions. The following example of such a collapse is given by the author of *Arabia Deserta*:

"It is a proverb here, that a man will slay the son of his mother for an old shoe-leather. The breach was this: some children disputed for an apple, the strife increased, men rose from the clay benches, men came forth from the thresholds, and drawing to their partialities, every hot head cried down, despised and threatened his contraries. Men armed themselves, and the elders' reverence was weak to appease this strong sedition. Barbarous shoutings were answered with bloody words, they ran apart from both sides to their quarters, and as every man entered his cottage there he shut himself in and fortified the door, then he mounted upon his clay roof to shoot against the next hostile

\* See p. 168.

houses. None of them durst come forth more in all that year, for their adversaries would let shots fly at him from their house terraces. Upon both sides they saw the harvest ripen and stand out so long, without reapers, that all their bread was lost; at length also their pleasant autumn fruits, hanging ruddy in the orchards, rotted before their eyes. There fell eight beleaguered champions, in eight months, besides some it was said who perished with hunger. In this time many, not partisans, had abandoned Maan, the most went to settle themselves in the Hauran: all the small traders removed to Shemmia—These Eve's sons were lost for the apple at Maan!"

A stable organised community can only continue to exist on condition that the aggressive tendencies of its members do not lead them to try to dominate each other by physical violence. It has been argued by Bovet that the aggressive tendency has behind it an energy which, if denied one outlet, must be used in another direction if the individual is to attain inner harmony.<sup>20</sup> Thus the successful transformation of aggressive tendencies of its members is as necessary a problem for a society as the successful transformation (or "sublimation") of their sexual energies. The aggressive tendency may be given an outlet in competitive games, in arduous struggles against the forces of nature such as are found in exploration, in mountaineering, or in a struggle against moral evil. It may provide the energy behind the militant enthusiasm of an ardent pacifist; and the lust of intellectual battle may be seen in the eyes of a sociologist hotly contesting against the theory that there is any innate tendency to aggression.

There is, however, one mode of expression of the aggressive tendency which is of outstanding importance for social psychology since it is one of the two principal motives of our own social structure. This is the domination of other people, not by the prohibited method of physical violence but by the socially permitted methods of economic and social competition—by the purchase of other people's labour and subservience and by the gaining and utilising of the prestige attached to a superior social position.

The nature of this struggle is seen in any story of a young man or woman who has started in humble circumstances and has "made good." One aspect of the story is the acquiring of wealth; from being only able to satisfy primary needs, the individual has risen to the position of being able to indulge in luxuries and to accumulate capital. An equally important aspect is the rise from a subordinate to a dominating position. At one time he had to obey orders and to address his superiors by titles of respect, but he ends by giving orders and by being addressed respectfully. He has engaged in a long struggle against others which has ended in their subjugation, a struggle in which he has employed no physical violence; his weapons have been his intelligence, his skill (perhaps in the use of words), the elements of his character by means of which he can impose his will on other people, and (in the later part of the struggle) his money and his economic and social position. It has been a fight, although transformed from the primitive struggle of physical violence. The domination finally achieved is likely to be more satisfactory to the individual concerned than the mere acquisition of wealth.

There are certain problems of individual adaptation which result from the strength of this motive of competition for social domination in modern society. It is an end which, from its very nature, must be attainable to only a few. The remainder suffer from the frustration of an impulse which has been strengthened by social influences and has remained unsatisfied. Unless they have the power of renouncing this unattainable end of dominating other people, they will seek to gratify it in socially undesirable ways (by petty family tyranny, or by a cantankerous attitude towards other people), or it may simply make them neurotic and unhappy.

The evils which result from inordinate love of money are amongst the commonplaces of the moralists. Less attention has been given to the evils which result from inordinate lust

for power. It is the merit of the psychotherapeutic system of Adler that he draws attention to the capacity of this factor to destroy happiness and social efficiency. He sees in all neurosis an attempt to satisfy a frustrated desire for power. By being ill, a hysteric may gain the power of imposing his or her will on other people which exceeds any power that could be gained by healthy activity. His method of cure is to make clear to his patients this source of their symptoms, and to lead them to renounce the unsatisfied desire for power which was making them ill. It is unlikely that this is a complete account of the origin of psycho-neurosis, which probably needs for its full explanation the sexual factors postulated by Freud, but Adler has undoubtedly done service to psychology in pointing out the unsatisfied desire for power as one of the principal sources of unhappiness and social maladaptation. This is, in truth, only a rediscovery of what was believed by the mediæval religious teachers who taught that the road to peace was the way of humility and the renunciation of self-love.

## 8. Our Competitive Acquisitive Pattern of Culture

Every community carries on its life after a pattern determined by the traditional aims which each individual pursues, and the incentives which have social approval. These patterns are called by Ruth Benedict "patterns of culture."<sup>21</sup>

Thus the Zuni Indians of Arizona are ritualistic and conventional. An individual's wealth is used to enlarge his prestige by increasing the importance of the ceremonial rôle he takes in religious ritual. One who tries to take leadership by his greater power or knowledge is censured. The good man is polite, conventional, mild and without arrogance. The Dobus of N.W. Melanesia are treacherous and murderous. Dourness is a virtue, laughter and merriment are avoided. "Suspicion and cruelty are his trusted weapons in the strife and he gives no mercy as he asks none."<sup>21</sup> The Kwakiutl of Vancouver Island practised cannibalism as a religious rite, attaining ecstasy through the repugnant and horrible. Their wealth consisted of goods (blankets, oil, etc.), titles of nobility, and etched



copper plates (coppers) with a high fictitious value. Social esteem was gained by lavish giving of presents or by destruction of wealth. A person was shamed if he could not return within a year presents of double value to those given him or if he could not destroy as much wealth as a rival. The purpose of wealth was to enhance social esteem by shaming rivals at contests of destruction of wealth (potlatches). Superiority to rivals was displayed by unrestrained self-glorification and ridicule of others.

Thus in three different societies, there are three different ideals: mediocrity and conventionality in the first, malevolence in the second, and megalomaniac self-assertiveness in the third. The ideals of each would be misfits in the others. In our own society, the person who conforms to the ideals of Zuni is not uncommon, but he is regarded as a failure and can hope only for a lowly-paid job, in which he is used and despised by the more self-assertive members of his society, the ideal Dobu would be imprisoned as a criminal, while the person conforming to the Kwakiutl ideal, if he did not succeed in becoming a dictator or a successful business man of the predatory type, would probably find himself in a mental hospital.

The traditional and socially approved aims which give its characteristic pattern to our own society are acquisitiveness and the transformed aggressiveness which aims at domination over other people by other means than physical violence (*i.e.* by social and economic competition). These are the two aims whose achievement is summed up in our phrase that somebody has "made good." When we say that these are the two characteristic motives of Western civilisation this does not mean that amongst ourselves the acquisitive and aggressive tendencies are innately stronger than amongst other people. Very likely they are not. But educational and social training are directed towards the strengthening of these motives, and it is only so far as the individual has learned to react to them that he can fit in easily to the structure of society.

There are many cultures amongst whom the acquisition of a large fortune by a private individual (*i.e.* one who is not a ruler) is not regarded as a socially desirable course of conduct. It may be dangerous to the individual who succeeds in doing it; it may, on the other hand, be impossible for him to succeed. Our industrial organisation happens to be such that there are various ways in which it is possible (although not easy) for a man starting with few possessions to accumulate great wealth, and we have a sufficiently well organised police force to protect him from the envy of those who want to take his wealth for themselves.\*

Similarly, in a primitive society with a hereditarily dominant social class, the motive of social dominance does not enter, for those who are not members of the ruling class cannot become socially dominant through any effort of their own. In our own society there are various roads open to the ambitious; they may become socially dominant by wealth, by literary success, or by membership of an elected ruling body.

The dominant motives of any pattern of culture are implanted in its members during their childhood. This may be the result of deliberate training or of unintended social influence. It has been reported that amongst the warlike Maoris, the father used to tease and anger his male children until they won his approval by turning and attacking him. Similarly it is reported of the boyhood of a well-known American millionaire that his father used to have small financial transactions with his children in which he cheated them as much as he could in order to make them sharp. These were special trainings for culture patterns dominated by pugnacious and acquisitive

\* That is, in Great Britain. In parts of the U.S.A. a millionaire runs a very grave risk of his children being kidnapped and held to ransom. If that practice continues, there is plainly a possibility that a point may be reached at which (as in more primitive communities) the advantages to an individual of the possession of great wealth are not worth the resulting risks

motives respectively. The giving of pocket money to children from which they make their own purchases and the saving of which is the necessary condition for buying an expensive article are all parts of a system of training for fitting into an acquisitive society.

Still more obvious are the methods of training for responding to the motive of social dominance. Individual competition is widespread in school work and games. The schoolboy is given his place in the order of merit of his class so that he may be encouraged to be top. So also he runs a race in order that he may, if possible, be first. Those he learns to admire in sport are the record breakers. This is the beginning of a training in the motive of excelling.

Our industrial system is so arranged that, on the whole, the objects of production and distribution shall be attained as a result of the efforts which men make to serve their own individual (or family) ends of acquisition and social domination. In the eighteenth century men could explain this fact by regarding the industrial system as a device of the Creator for deriving "golden conduct from leaden instincts." Now we are more inclined to regard it as a somewhat imperfect adaptation of a system of social institutions to the characters and needs of the people who work within them. If it must be admitted that, on the whole, the ends of production and distribution are attained by the activities of men working for their own gain and advancement, it is also true that these ends are very imperfectly attained and also that there are many undesired consequences of this organisation of motives.

It is obviously not certain that the man who gains wealth (even by methods socially approved) has done so by activities which advance social well-being. It is true that he may become wealthy by manufacturing an article which satisfies a real need previously unsatisfied. He may, on the other hand, make his wealth by manufacturing a worthless or harmful patent medicine and stimulating

the demand for it by misleading advertising. We cannot fairly judge the acquisitive competitive system without noticing that its motives act in such a way that a very large part of men's economic activities are directed into socially undesirable channels.

The concentration of wealth in a few hands and the formation of more and of less privileged classes with respectively more or less of economic advantages and social esteem are also secondary consequences of the free operation of competitive acquisitiveness. The resulting class stratification is a potent cause of social instability. The majority in any community must be disappointed of their aim to achieve wealth and a dominating social position. Our pattern of culture stimulates both sets of motives in everybody but denies their satisfaction to all but a few. It creates, therefore, a dissatisfied majority.

It is within the limits of our own pattern of culture that the great achievements of civilisation have so far been won. They have been won at a cost of individual disharmonies and of releasing disruptive social forces. Every pattern of culture has probably its own characteristic individual and social difficulties. Whatever changes may in the future be necessary in our own culture pattern, it is plainly the fact that many people lead harmonious and happy lives within the pattern of culture of Western industrial civilisation, responding to the acquisitive and social dominance motives without allowing their mental well-being to suffer from an inordinate love of money or of power. Those do so who show the normal response to these motives but who have also the power of renouncing the desire for money and power when renunciation is necessary. To provide adequate incentives for this renunciation is part of the task of religion. It remains possible that a change in our pattern of culture might make the attainment of harmony more easy and reduce the burden of unhappiness and neurosis which weighs on a large proportion of the inhabitants of the civilised world.

# CHAPTER XI

## LAUGHTER, PLAY AND WORK

### 1. The Problems of Laughter

There are two main problems in the psychology of mirth. First, at what kinds of thing do we laugh? Secondly, what is laughter itself (*i.e.* what are its nature and functions)? Different answers to both these questions have been given by different thinkers; and, since it is probable that none of these answers gives the whole truth, it will be as well to go over several examples of them and to glean what we can. The difficulty in the first question is not to decide what are the individual situations or objects which are liable to arouse mirth, but to discover what common property they have which makes them mirth-provoking.

It is possible, of course, that there is no one common element in all ludicrous events and things, but that more than one cause may provoke the same response of laughter. We must not forget that there are at least three classes in the ludicrous—wit, humour, and the comic\*—and it is possible that the mirth-provoking element is not the same in all of these.

### 2. Spencer's Theory of Laughter

Spencer was mainly concerned with the nature of the physical behaviour of laughter, not with the objects producing it.<sup>227</sup> Incidentally he mentioned that the causes

\* These three classes of the ludicrous are not sharply distinct, for they pass insensibly into one another. We may take the antics of the clown, or a dignified man running after his hat as types of the comic. A ludicrous incompatibility with ordinary experience is an essential element in the comic. The word "wit" is used of a ludicrous manipulation of words; the pun is one variety of witticism. Like wit, humour may be conveyed by words; but in verbal humour the ludicrous element belongs more to the meaning and less to the form of the words than in wit.

may be acute pleasure, acute pain (as in hysterical or sardonic laughter), or a ludicrous situation. The essence of the latter he supposed to be "that consciousness is unawares transferred from great things to small . . . there is what we call a descending incongruity."

He noted that emotional tension is dissipated by bodily activity and intensified by being denied expression in bodily activity. Anger is relieved by violence, sorrow by weeping. Laughter is, he thinks, similarly a discharge of mental energy through bodily activity, only it is an activity of incoordinated movements of facial muscles and those used in breathing. Its function is to relieve mental tension. The particular movements of muscles we call "laughter" have no further significance than that they are convenient ones to serve as an outlet for mental energy otherwise not used in bodily activity.

### 3. Bergson's Theory of Laughter

Bergson takes a man slipping on a piece of banana peel as his first type of the kind of thing at which we laugh.<sup>24</sup> We laugh at this because, in falling under the action of gravity, the man is behaving like inanimate matter instead of carrying out the purposive behaviour characteristic of a living being. The function of the laughter is to punish mechanical rigidity or clumsiness of behaviour. With great ingenuity, Bergson extends this explanation to all the variety of things at which we laugh. In the contortions of clowns, the rigid gestures of an inferior orator, and even in witticisms, he traces the same mechanical rigidity as the element which determines our laughter.\*

A good deal of ingenuity is necessary, however, to fit these causes of laughter into Bergson's formula of

\* It is not a fair criticism to say that we do not laugh when we see a man fall over the edge of a cliff. Bergson recognises that mechanical behaviour is not the only condition necessary to evoke a response of laughter. It is also necessary that the situation should not call out any very strong emotion.

mechanical rigidity, and his explanation of the function of laughter breaks down completely when we try to extend it to these cases. Undoubtedly the theory that laughter is a form of social chastisement is sometimes true. Certain kinds of awkwardness in social relationships are laughed at, and laughter stops them from being repeated. But it is equally true that the raconteur, the clown, and the wit are encouraged by the laughter of their audience and deliberately try to provoke it. We must distinguish between the laughter of derision and the laughter of approval. Laughter may have the function of conveying to the individual laughed at either social disapproval or approval.

#### 4. McDougall's Theory

McDougall has put forward a theory of the function of laughter which is suggested by the physiological theory of affect. Laughter has both the psychological effect of breaking up trains of thought and sustained activities, and the physiological effect of stimulating the respiration and the circulation, raising the blood pressure, and sending a fuller stream of blood to the head and brain. In other words, it produces the physiological condition characteristic of joy, and by direct action on the bodily system produces a state of *euphoria* or general pleasurable affect in the mind of the laughing person.

The things at which we laugh are the slight misfortunes of other people, which, through the sympathetic pain they induce, would otherwise have a continually depressing influence on our mental life. These occurrences which, apart from laughter, would have been mildly displeasing and depressing, become occasions of laughter, and this laughter breaks up the depressing train of thought which has been started, and produces pleasurable affect by direct action on the physiological system. In this form of

laughter we do not laugh because we are pleased, we are pleased because we laugh.\*

While recognising that this theory provides a valuable explanation of the very common form of laughter produced by minor pains, there seems no reason for restricting this source of laughter to sympathetic pains. Minor pains of all kinds (even our own) can produce laughter, and the laughter saves us from their depressing effects. Certainly this is not a complete theory of laughter, for all small pains even of other persons are not ludicrous. It is much funnier to see a man sit down on a pin than to see him prick his finger, although the pains may be equal.

### 5. Freud's Theory of Wit

Freud has no new contribution to make to the question of the function of laughter,<sup>80</sup> but regards it as an expression of pleasure. His interest is in the problem of the origin of that pleasure. He notices in wit the tendency to compression—to make one word convey two meanings, or to convey a criticism or an indecent suggestion in words which appear on the surface to be merely harmless statements of fact. This tendency to compression he calls economy. Some forms of wit have this economic form of expression, but serve no ulterior end; these he calls "harmless wit." He takes as an example of harmless wit a comment of the *Flegende Blätter* on the saying, "Never to be born would be best for mortal man," that "hardly one man in a thousand has this luck." Harmless wit rouses laughter merely by its technique. It has (if we may borrow the terms from our discussion of art)† the "form" of wit without "content."

\* McDougall admits, however, Spencer's discharge of surplus nervous energy as a special form of laughter, found in nervous laughter and in the laughter of pure high spirits.

† cf. p. 472



A more common kind of wit is one which Freud calls "tendency wit," in which the witty form of expression is used to gratify a repressed tendency, sexual or hostile. The indecent witticism, for example, is an expression of a sexual idea which the mechanism of repression would not have allowed expression in a more open form. We may take as an example of a witticism with hostile tendency Freud's story of the comment of a guest at a party at which he was expected to admire the portraits of the two unscrupulous but successful business men who were his hosts. He gazed at the blank space of wall between the two pictures and asked: "But where is the Saviour?" The hostile idea conveyed by this criticism: "You are two thieves" would obviously not have been allowed expression in direct form. He sums up his theory of wit in the statement that the pleasure of wit originates from an *economy of expenditure in inhibition*.

Freud also extends his theory of economy to humour and to the comic. The pleasure from these is stated to be due to an *economy of expenditure in feeling and in thought* respectively. Now it is certainly true that wit uses a technique of verbal economy, but there seems to be no particularly good reason why this economy should excite laughter, and no reason at all for trying to extend analogous economy formulæ to other forms of the ludicrous. The pleasure taken in a neat witticism is rather of the nature of aesthetic pleasure and the laughter provoking element is the expression of hostility or of sexual ideas. So far as any wit is in Freud's sense "harmless" the pleasure taken in it would appear to be purely aesthetic and not to belong to the problem of the ludicrous at all.

Socially prohibited tendencies undoubtedly play a large part in all forms of the ludicrous. Mild physical and mental assaults make up a considerable part of humour. The laughter provoking quality of physical assault is increased if it is made on the buttocks which are part of the body about which speech is conventionally prohibited

The improper story, expressing ideas whose expression in ordinary speech is prohibited (of sex, excretion, or perverted sexuality), probably makes up the greatest part of the world's humour. Such laughter, however, may be essentially of the same character as that already dealt with. It may be laughter of relief due to the production of surplus nervous energy when the barriers of social prohibitions and one's own consequent suppressions are successfully overcome. On the other hand, it may be laughter of the kind distinguished by McDougall; it may be escape from a slightly painful situation by the production of joyful affect through the physiological effects of laughter.

The laughter producing qualities of "improper" stories obviously depend on the strength of the acceptance of the social prohibition of the banned subject by the group to whom they are told. The same story may arouse no tendency to painful affect and no laughter when told in a circle of psycho-analysts, an embarrassment which would be slightly painful if it were not broken up and converted into pleasure by laughter when told in a circle of men, and embarrassment too painful for laughter when told in a drawing room. In the first case, the strength of suppressions was insufficient to make the story even potentially painful, in the last case their strength was so great that a seriously painful situation arose, so again there was no laughter.

## 6. More Recent Theories of Laughter

Several new theories of laughter have been put forward since the first edition of this book was published. These need not be criticised in detail. All writers on the subject point out (quite correctly) difficulties in the way of the general application of the formulae of existing theories to every case of laughter and themselves put forward new and ingenious formulae which also seem to cover admirably the causes of laughter which the authors have

had primarily in mind and also seem to fit with difficulty cases remote from these.

J. C. Gregory recognises that there are different kinds of laughter (of triumph, of scorn, etc.) but finds that all examples of it have relief as a common quality.<sup>90</sup> J. Y. T. Greig in an illuminating and entertaining work on laughter and comedy sums up his theory as follows: " . . . the laugh is a response within the uncertain and ill-coordinated behaviour of the instinct of love. It appears to arise within such behaviour when an obstruction of some kind is first encountered, and then, no matter how, suddenly overcome; it marks the escape of psycho-physical energy mobilized to meet the obstruction, but not actually required for that purpose, and therefore for the moment surplus."<sup>91</sup> R. Piddington considers that "every ludicrous situation involves two conflicting evaluations in the social order which both apply to the situation in question."<sup>189</sup>

None of the writers mentioned has performed the investigation which would seem to be the only sound foundation for a scientific theory of the ludicrous: an exhaustive experimental research into all the things which do in fact produce the response of laughter, followed by an attempt to find a common element or some common elements of these things. Until that is done, we can only draw the best conclusions possible from the somewhat uncertain ground of common observation, and differences of opinion will result from the tendency to select common observations in accordance with the personal bias of the observer.

It is unsafe to predict the result of an enquiry before it has been made but we may guess that the result of such an investigation into ludicrous things and situations would show that while these have some common features (perhaps many of those distinguished in the past) they are much more peculiar to each individual and to each social group investigated. Thus we might find out, by such an

enquiry, less about the nature of the ludicrous than about the attitudes or sentiments of the individuals investigated and about their social affiliations.

## 7. The Social Character of Laughter

A fact which has received insufficient attention from those who have put forward theories of laughter is its predominantly social character. A man laughing by himself is so unusual as to attract attention. Even good jokes read in solitude rarely produce the response of laughter, although much poorer ones excite ready laughter when told in a circle of friends. We may also notice that laughter, when it occurs in a social group, shows a strong tendency to sympathetic induction; the laughter of others is itself a situation producing laughter.

The effect of this laughter in a social group is to cause a temporary cementing of the social bonds within the group. Thus the primary social function of laughter is to increase the response of primitive comradeship within a temporary social group. This cementing of primitive comradeship within a temporary group has as its necessary effect, an increase of the separation of the members of that group from any person outside it. Here we find the distinction between the attitude of laughing at and laughing with a person which Bergson overlooks. If we are laughing with a raconteur or humorist we are including him within the laughing group whose bonds are thus cemented. The laughter of derision, on the other hand, serves the function of excluding the person laughed at from the comradeship of those laughing.

Thus when men laugh at one of their number who has been guilty of some error of taste or breach of the social habits of his class, this is not so much to chastise the guilty one, as to dissociate the laughers from his error. They show that he is not of their group; and, therefore, that they would not commit such behaviour themselves. We

may notice also that in a strongly conservative group, the revolutionary is an object of laughter and the expression of even mildly revolutionary opinions by one of the group members is checked by the laughter of derision. Again there is a threat to the cohesiveness of the group which is counteracted by laughter.

The use of laughter for cementing together a group is, of course, known to the orator. There is a rule of public speaking that one should always begin with a humorous anecdote; a rule which some speakers carry out with mechanical rigidity. It is true that cementing of temporary group relationships also results from other kinds of behaviour carried out in common. A speaker might gain his ends by making his audience weep together instead of laughing together. Laughter, however, has many advantages for this purpose. It is more easily produced and more subject to the effects of sympathetic induction than most other kinds of behaviour, and the euphoria which accompanies it is in itself favourable to the establishment of the relationship of primitive comradeship.

A secondary consequence of the social nature of laughter is the fact that the objects and situations arousing laughter are partly determined by a process of social conditioning. Objects and situations habitually laughed at in a social group become, through that very fact, objects of laughter to those who become members of the social group. This fact would itself make it unlikely that we should find any common property of the objects of laughter. Some social groups laugh at a man who slips on a piece of banana skin; some laugh at a hunchback; others do not. An English and a Scots audience laugh at different things. If members of a social group observe that their own objects of laughter do not produce laughter in another social group they are inclined to express this fact by saying that the second group has "no sense of humour." The social psychologist will express this more

exactly by saying that the process of social conditionment of laughter in the second group has followed a different course.

### 8. Conclusions as to the Nature and Objects of Laughter

An adequate theory of laughter must recognise the diversity of its objects and probably also of its functions. It is thus impossible to bring all kinds of laughter under a single formula. Laughter has two marked effects, one individual, the other social. The effect on the individual laughing is, as McDougall points out, the production of a state of euphoria. The social effect is increasing the cohesiveness of the laughing group and their separation from one outside it. Laughter will tend to be produced by any situation in which either of the above effects will be serviceable. The occurrence of minor pains is an example of situations making serviceable the first effect; breaches of social conventions and all other threats to social unity make the second effect serviceable. There also appears to be laughter which is relatively functionless since it is an accompaniment of mere high spirits or a strong tendency to discharge pleasurable emotion into behaviour of some kind.

This gives us three types of laughter classified in accordance with their functions:

- (1) The laughter of high spirits or of relief.
- (2) The laughter of reaction against the slightly painful.
- (3) Laughter in a social group.

The objects and situations at which men laugh are partly determined by the functions of laughter mentioned above, partly by the particular circumstances of their lives which have conditioned them to laugh at some things and not at others. There are, no doubt, innately determined (or unconditioned) stimuli to laughter—the laughter of other persons is probably one, and there may be others.

Nevertheless, the subsequent process of conditioning probably plays so large a part in determining what is actually laughed at that it is unlikely that the nature of the ludicrous can be expressed by the possession of any common factor to be found invariably in all social groups. A man will laugh at those things which his social group has conditioned him to laugh at. These will partly be determined by the functions of laughter which have already been mentioned, and partly by the social customs of the society in which he happens to live.

Theories of laughter have generally been theories of some one common element in all the situations in which men laugh; very generally the common element claimed has been some kind of incongruity. A view much nearer to the one outlined above is that of Max Eastman who says: "Laughter, according to my view, may be a response to any pleasant stimulus, and to any unpleasant one that can be taken playfully."<sup>305</sup>

## 9. Play

Like laughter, play is a method of expending energy which, although certainly not functionless, does not seem to promote any of the ends which we commonly regard as the important ones of organic life—acquirement of food or commodities, escape from enemies, etc.—or indeed of any external goal. In play, the activity seems to be an end in itself, and its biological serviceableness is to be found in the fact that the activities of play bring into action motor mechanisms which will be of serious use in adult life. Young puppies, for example, carry out in play the same activities as they will use later in fighting and hunting, they roll each other over, take each other by the throat, chase each other, but all the time without doing any injury. They are, moreover, doing it with obvious enjoyment.

From the biological point of view, then, play may be described as a rehearsal of activities which will later be put to use in the serious business of life. The young puppy is strengthening his muscles, legs, back and jaws, upon which he will be dependent in the fighting and hunting of his adult life. On its psychological side, play is an activity enjoyed for its own sake (*i.e.* for the joy the activity itself brings). This is the essence of Groos's well known theory of play.<sup>92,93</sup> Groos recognised as play only those activities which satisfy both the biological and the psychological criterion. Playful activity is one which is a rehearsal of an instinctive activity, and it is an activity which is undertaken for its own sake (and not, of course, with the conscious aim of rehearsing useful activities).

The human child shows probably a greater variety of playful activities than any other young animal. He displays, for example, in addition to the fighting and hunting play which he shares with other animals, the activity of pulling things to pieces, which Groos calls *analytical play*.\*

He also shows *synthetic play* (with toy bricks or modelling clay) in which he builds up new things. These are clearly rehearsals of the adult behaviour of curiosity and of construction respectively. Later, he may exercise himself in play which simulates adult activities that are relatively distant from primitive forms of behaviour, as, for example, bartering, and even the carrying out of religious ceremonies.

This function of children's play as preparation for adult life must be borne in mind if we are to avoid the common mistake of undervaluing the importance in mental development of the child's play activities. It is often supposed that a child amuses himself until he reaches school age and then starts the serious business of education. In truth the child is educating himself while he is putting lids on to boxes, putting one block on the top of

\* Which is sometimes mistaken for cruelty when the object analysed happens to be a living creature.



another, etc., experimenting in speech sounds, etc. We can do little to help this self-education except providing him with such toys as he needs. The difference that takes place at the school age is not that education starts then but that a stage is reached in which more extensive adult co-operation is needed. Self-education by suitable toys may, in fact, be carried on even after the school age has started. The apparatus used in the Montessori system is, in effect, a set of toys devised for teaching reading, writing and calculation by a self-directed activity related to play. Such educational systems as the Dalton plan are an attempt to carry on the same principles of education when the child learns from books. Neither system is, however, pure play since in both the child's activity is partly energised by a more or less remote end instead of the present attractiveness of the activity itself. This is the distinguishing mark of *work*.

Activities which fulfil Groos's definition of play do not, however, exhaust the list of rehearsal phenomena to be found in animal and human life. Courtship, for example, is an activity which is to some extent a rehearsal of the sexual act, and is indulged in for its own sake. It does not, however, belong to quite the same class as the fighting or hunting play of young animals, for it is an adult activity, leading up to and having an obvious function in the performance of the sexual act itself. Other rehearsal phenomena discussed by Groos are the baby's exploratory movements of the hands, and his other activities which bring him new experimental sensations. We ought, probably, also to bring under the heading of rehearsal phenomena some of the infantile forms of emotional reaction which are regarded by the psycho-analysts as infantile elements from which the adult sex-instincts develop. The attachment of love to the mother, which is called by Freud the *Oedipus-complex*, probably serves a function in mental development similar to that of the playful activities. The *Oedipus-complex* is, perhaps, the infantile sentiment which is preparatory to the biologically more important sex-love of the adult.

Of a rival theory of play still mentioned in the textbooks little need be said. This is the *recapitulation theory*:

that the child in his play is impelled to recapitulate the behaviour of primitive man just as Haeckel described the foetus as recapitulating its evolutionary history in the course of its growth. Thus Stanley Hall says: "I regard play as the motor habits and spirit of the past of the race, persisting in the present, as rudimentary organs."<sup>98</sup> There seems no reason for supposing that there is any truth whatever in this theory.

There is, however, an important contribution to the theory of play which has been made in recent years which suggests that Groos's theory does not cover all the facts. The psycho-analysis of children has successfully used a method (the *play technique*)<sup>129</sup> which is based on the assumption that the mental conflicts of children are revealed by their play; that their play is a dramatic representation of phantasies which are important in their emotional lives.<sup>149</sup> Thus play with human figures may not always be simply maternal rehearsal behaviour (as play with dolls very generally is) but may be dramatisation of the child's phantasies of the relationship between its parents.

I do not think that anyone has claimed that this is true of all play, and it may well be true of a greater part of the play of the neurotic children who are brought to psychoanalysts than of normal children. Phantasy, however, plays a part in the life of all children, and it is likely that a certain part of all the play of children is exteriorised phantasy of the kind studied by the psychoanalysts. If, moreover, the psychoanalysts are right in believing that all children suffer from more or less severe mental tensions which are more disturbing to them than they would be to adults because of the child's lesser power of tolerating mental pain, it may well be that such play serves an important part in maintaining mental health in the normal child. It is significant that Melanie Klein notices inability to play as one of the marks of the neurotic child.<sup>129</sup>

One should not omit to notice that play is not confined to the young. Even fully grown animals play, particularly the carnivores whose time is not necessarily fully occupied in getting food. Adult dogs very commonly play, and, amongst birds, ravens are conspicuously playful in their flight, showing prolonged and complicated aerial activity which seems to have no other end than the activity itself. For playful activity amongst adult human beings, one should look rather to spontaneous activities than to organised games. A man who makes a rockery in his garden or who drives his car to the water-side and there lights a fire may be more truly playing in the psychological sense than when he is golfing or at a bridge party, since the latter activities may lack the essential character of being pursued for the sake of the activity itself. Adult play is probably more nearly related to the phantasy play of children than to their rehearsal play, and may serve a useful function in the release of mental tension.

## 10. Work

Man's activities are not limited to those which are an end in themselves or which lead immediately to a satisfying result. He can also perform tasks which may themselves be monotonous or disagreeable for the sake of more or less distant ends. Such activity may be called "work." The incentives to work may be of many different kinds: avoidance of punishment which results from the cessation of work (as given to the horse by the whip), the attractiveness of the direct end result of a complex activity (as in learning a foreign language), an end achieved indirectly by the activity (as the money reward of daily work), etc. Some of these, as the threat of the whip, are present incentives, acting at the same time or immediately following the activity they promote, others, such as wages or salary, are remote ones.

The ability to perform uninteresting activities under the pressure of other than immediate incentives is almost peculiar to man. Horses, oxen, dogs and elephants can be taught to work, but the incentive is the immediate one of punishment. The actual use of punishment may be rare because the work activity is at first only an extension of a natural activity of the animal and becomes later a habit system. Even this amount of capacity for drudgery must be rare in the animal kingdom, for there are few other animals which man has succeeded in exploiting in this way. Kohler found that a chimpanzee was very reluctant to gather up scattered banana skins excepting during the first few days on which he was required to do this.<sup>132</sup> Yerkes reports Boutan as finding extreme fatigue in a gibbon after directed activity in test situations.<sup>283</sup>

In contrast with this we find civilised man everywhere capable of prolonged drudgery for remote ends. Much of the pattern of our civilisation is dependent on the capacity of many of its members to perform tasks which in themselves are unattractive, in order to draw wages at the end of the week. Races whose temperamental constitution is such that they cannot adapt themselves to this requirement, are unable to adopt our pattern of culture.

There is plainly no sharp line between work and play. Activities originally engaged in for their own sake may later become organised into habit systems which are pursued only for the sake of the ends attained. Work so based is less far removed from play activity than is work whose elements are in themselves disagreeable from the beginning. Most of the training of a horse is simply a re-direction and modification for his owner's ends of activities which the horse would himself indulge in spontaneously. A savage in hunting may undergo prolonged discomfort in order to achieve the end of killing his game, but it might not be possible to train him to a wage-earning occupation in a factory or office in which the

activity itself is further removed from spontaneous human activities.

### 11. Incentives to Work

In considering the relative effectiveness of different incentives to work, it must not be forgotten that incentives need not be continuously operative in work of a kind that has been carried on for a long time. A working horse may very rarely need either the application or even the threat of the whip. He has formed a habit system of drawing his burden, which, on the whole, works automatically in response to signals from his driver without the application of any external incentive. So also the human being engaged in uninteresting work is carrying out a system of habits, interference with which would itself be unsatisfactory to the worker, even if the remote incentive of wages were absent.

For this reason, in an industrially trained community the individual's dissatisfaction with unemployment is not removed by the payment to him of money during enforced idleness. Even apart from the fact that the smaller unemployment benefit is a less strong incentive to idleness than are wages to work, idleness is itself a less attractive situation to the man accustomed to work, so work would be preferred if the external incentives were equal. Bakke, investigating unemployment in London, found this strong preference for work over unemployment.<sup>12</sup> A typical statement of it is quoted from a brewery hand: "Your money at the Labour helps out a bit, but it don't give you no work to do, and that's what I miss." This preference is indicated by the small number of recipients of benefit whose claims were disallowed for not genuinely seeking work (only 1.3 per cent. of men, 2.7 per cent. of both sexes).<sup>\*</sup> Since it appears likely that, in the future, increased efficiency of industrial methods will make

<sup>\*</sup> (*Unemployment Insurance Committee, 1927, Minutes of Evidence.*)

necessary only relatively short hours of work for everyone, the educational problem of training for leisure is little less important than that of training for work.

While a normal man prefers activity to continued idleness, his efficiency in doing the task at which he is employed depends partly on the incentives which are moving him to activity. There has been a good deal of experimental investigation of the effectiveness of various incentives. Probably also his happiness and contentment in his work depend on the nature of the incentives to work, although these results of varying incentives are more difficult to measure.

The primary incentive to industrial activity is, of course, its money reward. At relatively low amounts, the incentive value of this may be simply that of the necessities of life which can be purchased with it, but (as is mentioned elsewhere) the insatiableness of the craving for money makes it of continued value as an incentive even when all primitive demands have been satisfied. A more remote incentive is less effective than a less remote one, so a weekly wage is a more effective incentive than a salary. Even a weekly wage is a somewhat remote incentive, so industrial efficiency may be increased by the additions of other incentives. Thus a task in which the worker sees an actually completed result (as in the assembling of a piece of machinery) has greater incentive value than one in which a single operation is continuously repeated (as the repetition of the screwing on of a nut on one part of a machine which is being assembled by a line of workers). A monotonous task may, however, be given incentive value if the number of times the operation is carried out can be varied by the worker's effort and his success in doing it a large number of times is known. If it is known only to himself, the incentive is self-competition; if it can be compared with the score of others, the incentive is competition with these others; if a bonus is paid on accomplishment above a certain level, the wages incentive is added to these.

Mace has shown that the improvement in work which results from knowledge of the degree of success and its comparison with a standard may be measured under experimental conditions and compared with the effects of other incentives.<sup>181</sup>

In drawing practical conclusions from experimental work on incentives to work, it must not be forgotten that a system of incentives which makes for maximum output is not necessarily the best for the worker. It is true that the absence of immediate incentives may make work tedious and uninteresting, so their introduction may make the conditions of work more satisfactory. On the other hand, a system of incentives designed to increase production may be a serious burden to those working under it through the strain that it induces. Nor must it be forgotten that increasing strength of incentives may increase intensity of effort without increasing its efficiency. A bricklayer might lay more bricks if he knew that failure to lay a certain number would result in a loss of wages; it does not follow that he would lay still more if he knew that the penalty for failure was that he would be shot. For every condition of work, there is probably an optimal range of incentive strength, above or below which there will be less efficiency of work. It is probable that for timid children the threat of physical punishment is an incentive which exceeds this optimal strength, and which therefore does not for them increase efficiency of school work.

## **12. Education for Work**

Since, in any industrial community, social well-being depends on this capacity of its members for work, the problem of education for work is one of great practical importance. In the activity of children there is no sharp line between play and work. In the earliest play of children the bodily movements and their immediate results are ends in themselves. Later (from about age 1; 6,

according to Charlotte Bühler's observations) an end result such as the structure made with bricks is the incentive which directs the separate movements which lead to it.<sup>22</sup> These movements are no longer themselves ends but are means towards another end. This kind of activity is the beginning of work. Later, separate activities, themselves tedious or unpleasant, may be willingly carried out for a desired end.

The behaviour of the child carrying out the separate actions of building for the sake of the completed structure is of the same general kind as that of the older boy or girl learning a vocabulary in order to attain mastery of the language or to pass an examination in it. In this case, however, the end is much more remote. It is through activities of which the separate parts are motivated by the end to be accomplished that the child learns finally to work for more remote ends and to overcome greater repugnance for the part activities themselves, and so learns to work. Modern systems of education try to utilise this willingness of a child to work for the end result of a system of activity. The tasks through which the ability to work is learned may have as their incentives less and less immediate ends as the child grows older. This seems to modern educators to be a better way of teaching the child to work and to tolerate drudgery than that in which such an external incentive is used as the fear of punishment or blame.

### 13. Fatigue

The continuous performance of work or of any other activity is interfered with by a tendency for its efficiency to be reduced by the after-effects (physiological and psychological) of previous activity, particularly of the same or a similar kind. To this tendency we give the name *fatigue*. A curve showing the onset of fatigue can be obtained by means of an instrument called the *ergograph*.<sup>\*</sup> The subject is required to deflect his middle finger,

<sup>\*</sup> Any curve showing the decrease in quantity or quality of the work done on successive performances of an action is called the *curve of fatigue*.



which is so connected with the instrument that each deflection raises a weight for a short distance. After the operation has been performed several times, the deflections of the finger grow smaller and finally cease. Rest is now necessary before the finger can recover its ability to raise the weight. If, however, the weight is lightened, a new series of deflections can be obtained.

The condition of fatigue has also a mental concomitant—the feeling of tiredness—a complex of bodily sensations generally unpleasant. This feeling usually accompanies the conditions of reduced efficiency of working which we have called fatigue. Hence the word “fatigue” is commonly used in popular speech indifferently either for the conscious fact (knowable only to his own introspection) that a man feels tired, and for the fact (knowable to other persons through study of his behaviour) that continued activity has caused reduced efficiency in that activity. Either or both of these facts is ordinarily indicated by saying that the man is fatigued. Such ambiguities must be avoided in accurate psychological description, and since we have used the word *fatigue* for the behaviour phenomenon, it will be better to avoid that word for the accompanying conscious phenomenon and to speak instead of the *feeling of tiredness*.

The most obvious explanation of the phenomenon of fatigue is the physiological one. When work is done by a muscle the energy for this work is supplied by processes of metabolism which take place in the muscle. These processes consist in the breaking down of more complex chemical substances and the formation of lactic acid. The products of metabolism accumulate in the muscle, which is thus rendered incapable of further work. In the ergographic experiment, however, the muscle refuses to contract any more before the accumulation of the products of metabolism has reached such a point that the muscle is really incapable of doing any more work. The end-plate of the muscle (the structure through which the nerve fibres are attached to the muscle) and the nerve fibres themselves refuse to transmit motor impulses to the muscle before the muscle itself is exhausted.\*

There is a further complication, however, in the explanation of the fatigue recorded in the ergographic experiment. It has already been mentioned that after the fatigue of the finger a new series of

\* The end-plate thus acts in the same way as the fuse in an electric light circuit. This is made of an easily fusible metal which will melt and therefore interrupt the current long before the current is strong enough to injure the other parts of the circuit.

contractions can be obtained if the experimenter reduces the weight. It was discovered by R. A. Spaeth that with certain subjects it is sufficient to tell them that the weight has been reduced in order to get a further series of contractions from the finger, although meanwhile the weight may actually remain unaltered.<sup>220</sup> This suggests that the inability of the muscle to make further contractions is not entirely the result of its physiological condition (or that of its endplate or motor nerve-fibres), but that there is a central factor at work as well. \* Judging, therefore, from actual performance it is impossible to separate the effects of genuine physiological fatigue from central interference with the performance of work.

The difficulty of making precise the conception of fatigue in mental work is even greater. It is certain that we all feel tired after a hard day's mental work, and that both the quality and quantity of mental output is then reduced. How far this reduction is caused, however, by a factor similar to physical fatigue and how far it is due to a central inhibition related to the condition of boredom, it is impossible to determine. Arai performed the incredible task of multiplying pairs of four figure numbers in her head for twelve hours a day for four days, and found that her time for working out each sum at the end of each day's task was only twice as long as at the beginning.<sup>225</sup> This shows that an extremely severe mental task may be followed by surprisingly little fatigue effect.

We shall attain to a conception of fatigue which will apply both to bodily and mental fatigue and will be in accordance with the complexities of the experimental facts if we regard it as primarily not a direct result of the exhaustion of the muscles employed but as a mechanism of internal inhibition which protects them from exhaustion.† It may be noticed that all the symptoms of muscular and of mental fatigue have as their tendency the prevention of the performance of further activity. In muscular fatigue there is slowness of movement and loss of co-ordination, in mental fatigue there is a loss of control over the thought processes and a tendency for the mind to wander. The symptoms of muscular fatigue are

\* An example of a central factor simulating fatigue is the condition known in ordinary speech as "boredom."

† Some of the external symptoms of fatigue are, of course, direct results of the physiological effects of work. Such, for example, are the increased rate of breathing, muscular stiffness, etc.

produced when the products of metabolism have accumulated in the muscles because such accumulation marks a stage in bodily activity when much more activity would be injurious to the tissues employed. The point at which fatigue comes on, however, is also determined by other factors, as, for example, the strength of the incentive to work. Fatigue sets in very quickly when we take monotonous and uninteresting exercise. For example, when we walk through dull streets all the symptoms of fatigue may develop when the amount of metabolites produced must still be very small, while ten times as much exercise might have been taken through enjoyable country with less apparent effect of reduced efficiency. The influence of other factors is even more apparent in mental work. The feeling of tiredness, headache, and mind-wandering may be found to develop in a short time of working at an easy but thoroughly uninteresting mental task (such as marking elementary examination papers). This cannot be a direct result of exhaustion of some group of neurones in the brain, for a more difficult but more interesting task may be carried on for a much longer time without these symptoms developing. Indeed, Arai's work leads us to suspect that no ordinary mental task ever brings us near to the true exhaustion of the part of the brain used. Biologically, no doubt, the function of mental fatigue is to protect our brains from such activity as would injure them, either by too long sustained mental work or by not going to sleep at night. This protective mechanism appears, however, to be a very sensitive one and it may be set into operation by a merely monotonous task. In abnormal conditions the fatigue mechanisms may operate with no adequate bodily cause. This is, for example, one of the symptoms of *neuraesthesia*.

The onset of fatigue (or of the partial muscular exhaustion of which fatigue is a symptom) limits the amount of muscular work which a man can do in one day. This explains the fact that reduction of working hours does not always reduce output, but may actually increase it if the earlier working hours have been excessive so that workers have been in a condition of chronic fatigue. Other practical effects of fatigue study have been to show the value of rest pauses in certain occupations, and to make possible the elimination of wasteful and inefficient methods of work (such as those in which unnecessarily large weights are lifted, in which work is unnecessarily monotonous or carried out under bad conditions, and in which the optimal period for working is exceeded by "overtime")

## CHAPTER XII

### THE PERCEPTION OF THE EXTERNAL WORLD

#### 1. The Organism and its Environment

The simplest living creature is an organism surrounded by other objects. Its continued existence as a separate living entity depends on the continued suitability of its reactions towards other objects. These may be divided roughly into two classes, those that are harmful and those that are beneficial to it. Towards these two classes of objects it adopts reactions of opposite kinds, which we may call *avoiding* and *seeking* reactions.\* Thus the primitive organism avoids other organisms seeking to prey on it by contraction or withdrawal of its whole body (an *avoiding* reaction). It secures its own food by bringing its body towards the desired object (a *seeking* reaction).

The continued existence of the organism clearly depends on its success in adopting the appropriate reactions towards different objects. An organism which had a tendency to adopt an avoiding reaction towards its own food supply or a seeking reaction towards other organisms which required it as food would soon be eliminated altogether. Thus the tendency to adopt the appropriate reaction in different situations is implanted by natural selection, and we find even such simple organisms as the amoeba seeking and ingesting smaller amoebas or escaping from larger ones without any previous learning.

These are the essential facts of the conditions under which animal behaviour and thought have grown up.

\* Or *negative* and *positive* reactions.

There is a free-moving organism of delicate and complicated structure, and a real outside world, partly dangerous and partly helpful to the organism, about which his sense-organs must give him so much information as will enable him to make suitable reactions towards different parts of this outside world. By the interaction of the environment and the physiological structure of the organism is produced a series of movements of incomparably greater complexity than those of inorganic matter, which we call the organism's *behaviour*.

The environment of the human being is, of course, almost infinitely more complex than that of an amoeba, and his reactions towards it are also more complex. His behaviour is more difficult to study because he has also a mental life; he reacts to the situations in which he finds himself by thought as well as by overt action. But this complexity should not blind us to the fact that the biological nature of human development is essentially the same as that outlined above.

In the long course of evolution, man has been surrounded by an environment partly favourable to him and partly hostile. Every individual's survival has depended on the effectiveness of his reactions towards that environment. The growth of his mental powers has always resulted from the necessity of this attunement between himself and his environment. Consciousness has developed because the conscious organism can adjust itself better to the demands of its environment than can an unconscious mechanism of the same organic complexity. A great number of the processes of life have remained outside consciousness because their presence in consciousness was of no value for the adjustment between the organism and its environment.

## 2. Mental Life

We cannot, of course, say at what point in evolution mental life begins. We do not know whether the amoeba

has any consciousness, nor is this a problem which we can profitably discuss. We have, however, in our own consciousness what appear to be the mental correlates of the primitive withdrawing and seeking reactions. These are the conditions known as "pleasure" and "unpleasure." Pleasure is the feeling accompanying the experience of a beneficial environmental condition and is accompanied by behaviour of the seeking kind; while unpleasure is felt in a hurtful environment and is accompanied by behaviour of the withdrawing kind.

As we go up the animal scale, mental life becomes more complex as the environment becomes more complicated. It still goes on, however, in a manner not altogether different from that of the primitive scheme sketched above. There is still response to stimuli from the outside world (and sometimes from inside the organism) which demand action. There are *affective* reactions to stimuli which modify the responses of the organism to the stimuli. And there are the actual actions, whether volitional or impulsive, which are carried out by the organism in response to these stimuli."

One of the complications in more developed animal life is that the organism can not only react to actually present objects, but can also react to the thought of objects not actually present: The mental representations of these objects are what we call *images*, and in the existence of *images*, *words*, and *imageless thoughts*, we reach entirely new levels of reaction. We may still remind ourselves of the principle with which we started this discussion. All these more developed mental processes have occurred in evolution through their survival value. The highest flights of intellectual thinking are made possible to us because the use of words enabled our ancestors to deal more effectively with their environment. Correct thinking about ultimate things, such as we may hope to attain by philosophy, was not the evolutionary purpose of our development of verbal thinking.

### 3. Sensation

For giving us information about objects outside us we have a large number of nerve fibres ending in the skin or in special sense-organs such as the eyes, nose, etc. These are called the *exteroceptive* nerve fibres. It is probable that the one organ of sensation originally was the skin, and that the special sense organs are merely parts of the skin differentiated to respond to particular stimuli.

Some sensations are still given by the skin. These are heat, cold,\* pain and touch. It has been discovered that these sensations are not given over the whole area of the skin. Heat and cold are sensations given only at certain numerous points of the skin known as heat- and cold-spots.† Touch is given by points at the root of all the hairs on the skin and at other points often thickly crowded together in such hairless areas of the skin as the tips of the fingers. Pain sensation is given from very much more numerous spots known as the pain-spots. These pain-spots seem to correspond to free nerve endings in the skin. Heat, cold and touch have special small end-organs in the skin in which their own nerve-fibres end. The end organs of touch are known, but those for heat and cold are still doubtful.

These are all the true skin sensations. There remain two kinds of exteroceptive sensation which do not belong to the skin at all, although they are liable to be confused with skin sensations. These are pressure and deep pain. Pressure is the sensation obtained from exteroceptive

\* It must be remembered that heat and cold are in no sense opposite sensations. As sensations, they are as different as heat and touch. It happens only that the physical stimuli producing them are opposite in character. They are, themselves, totally different sensations with totally different end-organs, found generally at different points on the skin.

† Head and Rivers distinguished also warmth—coolness as a separate pair of sensations from heat—cold<sup>98</sup> These are not confined to spots but occur over the whole skin. Other observers, however, have not been satisfied that these sensations are different in kind from the heat and cold sensations.

nerve-fibres in the muscles when the skin is pressed down on them. Deep pain is the sensation of pain obtained when this pressure is sufficiently increased. It can easily be shown that these sensations do not belong to the skin itself, for they can be obtained from an area of the body of which the skin has been rendered anaesthetic.

There remain the sensations which have special organs of their own. These organs are the eyes, nostrils, the tongue, the ear, and the vestibular apparatus (the semi-circular canals, etc., which are part of the structure of the ear). The normal eye is affected by the electro-magnetic vibrations we call light and gives sensations of white, black and the various colours which were attributed by Helmholtz to three primary sensory processes (red, green and blue or violet)<sup>298</sup> and by Hering to four (red, green, blue and yellow).<sup>302</sup> While there is no known crucial experiment which can decide between these two theories, it seems now that the older three-colour theory is more likely to be right than the ingenious substitute suggested by Hering.

The tongue is affected by chemical substances in solution and gives taste sensations of four clearly distinguishable kinds (sweet, salt, sour, and bitter), with two or three others (such as the alkaline and metallic tastes) whose claim to be considered as primary is doubtful. A part of the internal membrane of the nostrils is affected by gases diffused in the air and gives rise to a variety of sensations of smell, which (unlike the tastes) do not admit of simple classification.

The ear is a sense-organ which is affected by vibrations in the air and these produce sensations of sound. When the vibrations are regular (*i.e.* of simple harmonic form) the sounds produced are pure musical notes of pitch dependent on the frequency of the vibrations; when the vibrations are irregular the sensation is that of noise.

In our normal use of the senses, each sense-organ is responding to only one kind of stimulus—the eye to light-waves, and the ear to sound-waves. These are the *adequate*



stimuli for the sense-organ in question. But experiment shows that it is possible to produce a sensation in an end-organ by the use of another stimulus than the adequate one. The retina can, for example, be stimulated by pressure, and an isolated cold-spot can even be stimulated by a hot object. In this case, the sensation which appears is the one belonging to the end-organ, not the one belonging to the stimulus. Thus, pressure on the eye produces a sensation of light, and a hot object touching an isolated cold spot gives a sensation of cold. In other words, a sensation gives direct information about the end-organ stimulated, not about the nature of the stimulus.

There are other nerve fibres in the body which give us information about the internal condition of our bodies. These are the *interoceptive* nerve-fibres. These are in action, for example, when we feel hunger or indigestion. They are of particular importance in the psychology of the emotions and the feelings of pleasure and pain, for it is probable that some part of all such experiences is a sensation of internal bodily changes—that for example, feeling afraid is (like feeling hungry) an experience largely composed of sensations of changes in one's internal organs communicated by the interoceptive nerve fibres.

There is a third class of sensory nerve-fibres called the *proprioceptive*. These give information about the positions of the limbs and about movements of muscles and joints.

It will be seen that there is no good foundation for the popular idea that the number of the senses is five. There are five sense-organs, if we count the skin as one, but these give rise to more than five sensations. The skin alone produces at least four distinct sensations. The sensory apparatus we have described, however, comprises the whole of the mechanism by which we get impressions from the outside world. The mental representations of outside objects, which we call *perceptions* are our reactions to the impressions conveyed by one or more of these sense organs.

#### 4. Perception

Since we know that it is by the excitation of our sense organs that the process of perception is started, we may be led to hold a theory of perception which experiment shows to be very much too simple to fit the facts. This is the theory that each end-organ when stimulated gives rise to its own sensation, and that these sensations combined are the perception. This has been called by Köhler the "constancy hypothesis."<sup>287</sup> It seems particularly plausible as an explanation of visual perception. We know that the corneal surface and the lens form a refracting system which produces a photographic image on the retina. The retina is composed of a multitude of end-organs (the rods and cones); each of these is stimulated by the light of that part of the retinal picture which falls on it, and might be supposed to transmit through one of the fibres of the optic nerve an impulse to a corresponding point of the brain surface where it gives rise to its appropriate sensation. Then the visual perceiving of the outside world would be simply the becoming aware of a picture already formed by a mosaic of sensations.

That visual perception takes place in some such way as this was generally taken for granted by the psychologists of the past. The most systematic exposition of this view has been given by the great physiologist and psychologist Helmholtz.<sup>288</sup> It has always been clear that it was not a complete account of visual perception since this is not merely the forming of a visual picture but the appreciation of the significance of its parts. If, in the seeing of a house, all that is given by sensation is a rectangular red patch, it is certain that we are also aware that it is a house, that it is made of brick, that there are rooms inside it, etc. All of these additional parts of the complete perception were called its "meaning" and were supposed to be added by the activity of such processes as memory and judgment to the system of sensations which formed the core of the perception. It was not doubted, however, that all that

was immediately experienced in perception was this system of sensations, each determined wholly by the nature of the stimulation of some end-organ.

There are, however, many objections to this account of visual perception. In the first place, if the retinal image were transmitted as a picture to the brain, the number of nerve fibres required for the transmission would be equal to the number of sensory elements on the retinal surface. In fact, their numbers are not equal; the number of end-organs in the retina is about two hundred times the number of fibres in the optic nerve.

Another difficulty is made by the fact that there are many characters of visual perception which have no corresponding sensation, such as, for example, depth. On the older theory, it was stated that we see extension directly but that we infer depth from such immediately experienced facts as the double images which result from the disparity of the retinal images of objects at different distances.\* But this alleged difference between the perception of extension and of depth corresponds to no difference in our experience; we seem to perceive depth and extension equally immediately. Moreover, we may not experience the alleged facts of sensation from which depth is said to be inferred. If a solid geometrical figure is drawn from two different points of view and the resulting two pictures are presented separately to the two eyes (as in a stereoscope) it is easy to verify that when solidity is most perfectly seen, the doubleness of images disappears.

Even if we confine ourselves to the very simple case of the perception of colours, the matter is by no means so simple as the constancy hypothesis would lead us to suppose. It is commonly said that light of a certain wavelength (or combination of wavelengths) will give us the

\* Thus Berkeley said: "Distance, of itself and immediately, cannot be seen For distance being a line directed endwise to the eye, it projects only one point in the fund of the eye, which point remains invariably the same, whether the distance be longer or shorter."<sup>281</sup>

sensation of yellow, another of blue, and so on. But there are, in truth, differences in the appearances of colours which have nothing to do with the wavelength. The yellow colour of a lemon looks different from any yellow colour we can get from the spectroscope. In the one case the yellow is seen on a surface, in the other as a spongy film of indefinite location and thickness. Both look different from the yellow of a glass of lemonade. Yet all three may be stimulating the retina in exactly the same way, as is shown by the fact that they may all look identical when observed with one eye through a blackened tube. When looking at them in the normal way with both eyes, their colour characters must be supposed to be due not simply to the nature of the stimulation on the corresponding part of the retina but also to their spatial relations to other objects.

Katz would call the colour of the lemon a "surface colour," that seen in the spectroscope a "film colour," and that of the lemonade a "volume colour."<sup>125</sup> The differences between them may be called differences in the "modes of appearance"\* of the colours. These are real differences in the visual appearances of objects when there are no differences in the physical nature of the local stimulation and therefore (on the constancy hypothesis) no difference between the sensations.

There are certain facts connected with the appearance of brightness, size, and shape which bring out this point even more clearly. If a black paper is strongly illuminated and compared with a white paper in shadow, it is seen as much darker than the white paper even when both reflect the same amount of light to the eye. On the constancy hypothesis, we must say (as Helmholtz did) that they are then giving us equal sensations but that by a process of judgment we decide that the white paper

\* This is the usual English translation of Katz's *Erscheinungsweisen der Farben*. It could be expressed more idiomatically as "how colour looks."

is really the brighter. This, however, does not explain the actual facts. The psychologist who knows the nature of the effect and who can measure the light reflected from the two papers and knows it to be equal must *judge* that their luminosities under those conditions of illumination are equal. Nevertheless, he *sees* them as unequally bright and no effort of his thought processes can enable him to overcome this impression. As phenomena they are unequally bright.

Similar facts are found in the perception of size and of shape. If two objects of equal size are seen at different distances, the farther one looks the smaller, but very much less smaller than is its retinal image. If its actual size is increased until the two retinal images are equal in size, the farther object looks much the larger. There is an intermediate position (differing for different people) at which the apparent sizes of the two objects are the same. Then the farther object is "really" larger but makes the smaller retinal image.\*

So also a circular object seen at an angle may make in the eye a very much flattened elliptical image but the seen shape of the object may be little different from a circle. We can arrange an ellipse with its long axis in a line from the observer at such an angle that the apparent shape to him is circular. The shape of the retinal image will then be found to be that of a horizontally elongated ellipse. This shape is not, however, itself seen; what is seen is the circular shape which is between this stimulus shape and the "real" shape.<sup>245</sup>

\* These have been called "constancy" effects, since their general tendency may be regarded as that of making appearances (or "phenomena") relatively constant when stimulus conditions change.<sup>125</sup> Another way of looking at the matter is to say that phenomenal characters are not entirely indicated by stimuli but are a compromise between the characters indicated by the stimulation of the sense organ and those of the "real" object. This interpretation is implied by the term: "*phenomenal regression* to the real characters of objects."<sup>245</sup>

These facts were known to some at least of the psychologists who held the older view that perceptions were made up of sensations. They were regarded as "illusions"—*i.e.* as unusual facts of perception in which the activity of the mind itself distorted the experience and misled us as to the nature of the stimulation of the sense organ. Thus the tendency to constancy of brightness was explained by Helmholtz in the following way. When the brightly illuminated black paper looks darker than the shadowed white, it is, nevertheless, giving a brighter sensation than the white paper. By the operation of our judgment based on previous experience of papers in different illuminations, the white paper seems to us to be the brighter.

If we bear in mind the full range of facts which it is necessary that this explanation should cover, it will be seen to be unsatisfactory. In all everyday vision (*i.e.* in all vision except under such unusual conditions as monocular vision through tubes and other artificial laboratory devices), constancy effects are occurring all the time. If we lift our eyes now and look at objects around us, there will be no colour, no shape, and no size of objects which is determined only by the conditions of local retinal stimulation. How then can we properly speak of sole determination by local stimulus conditions as normal and of perception influenced by an active response of the mind as exceptional? The mind must be active throughout perception, and there is no reason for distinguishing "illusions" as a special class of experiences in which the activity of the mind interferes with the exact correspondence between appearance and peripheral stimulation.

Nor does there seem sufficient ground for asserting the existence of this "sensation" which exactly corresponds with the peripheral stimulus but which is elaborated by previous experience and judgment. In the above experiment with black and white paper, we can find out by physical measurement that the brightly illuminated black paper is making an equally bright retinal image. This

is a physiological fact, but there is no corresponding psychological fact; the so-called "sensation" is not a fact of experience. The assertion that although the black paper looks the darker, it is really giving an equal sensation seems to be based on no other foundation than the treating of the "constancy hypothesis" as an axiom.

Two different conditions of peripheral stimulation may thus give rise to equivalent experiences. To cause equal appearances of brightness under ordinary conditions of vision, a black paper must reflect more light to the eye than a white paper. To make equal appearances of size, objects at different distances must cast retinal images of very different sizes. In all of these cases, similar perceptual effects follow from different conditions of local stimulation. This makes it obviously difficult to accept the view that in perception, each local stimulation produces its own sensation and that these are combined to produce the perception.

These experiments may, of course, also be arranged to illustrate the opposite difficulty of the same conditions of local stimulation giving rise to different perceptions. This situation is found in an even more striking form in the reversible and ambiguous figures which have been particularly studied by Rubin.<sup>286</sup> If, for example, the four diagonals are drawn in a regular octagon and the eight resulting sectors are made alternately black and white, a figure is obtained which may be seen either as a white cross on a black background or as a black cross on a white background. Or a pattern may be made which appears as either a series of black T's on a white background or as a series of white fleurs-de-lys on a black background. These are truly different perceptions although they arise from identical stimulus conditions. On the sensation-plus-meaning hypothesis, they would be explained as identical systems of sensation with different interpretations or "meanings." Experimentally, however, there is no evidence that there is anything identical in the experiences

from reversible figures; a subject who has on a first exposure seen the black T figures, will not recognise the pattern as the same if, on a second exposure, he sees the white fleur-de-lys figures.

There is another serious objection to the theory that perception is based on the blending together of a mosaic of sensations each of which results from the stimulation of some sensitive end-organ. This is the fact that on this theory a sensation must sometimes be supposed to occur when no stimulation has caused it. We know that where the optic nerve enters the eye there are no visual end organs, this is a blind spot. Yet when we close one eye there is no corresponding gap in the visual field. If we move the eye so that the image of a small object on the wall falls on the blind spot, we can no longer see it, but there is no gap in the visual field, the wall paper is seen as if it were continuous over the spot which was occupied by the missing object. If a line or other simple figure runs over the blind spot it is seen as complete even where its retinal image is falling on the insensitive part. Even more strikingly, Fuchs has shown that if injury or disease of the optic nerve renders one half of the retinal surface insensitive, a simple geometrical figure whose image is thrown partly on the sensitive and partly on the insensitive side of the retina may be seen as complete.<sup>285</sup>

If a perception were built up out of sensations each of which was the direct result of the transmission of an impulse along a nerve fibre from an end-organ, we should expect a blank in the perceptual picture corresponding to places where no impulse has been transmitted. An analogy to this theory of the cause of perception might be found in a physically possible (although not actually used) method of transmitting photographs telegraphically by forming an image on a plate composed of a large number of photo-electric cells each of which was connected by a wire to a corresponding reproducing cell at the other end.



It is clear that if we cut some of the transmitting wires we should produce a blank in the transmitted picture.

If, however, perception is an activity of the mind itself of which sensory stimulation is generally a determining cause but not a necessary condition, absence of sensory stimulation over part of the area would simply mean that the mind would be free to complete that part in accordance with the laws of its own internal activity. The charts published with weather forecasts showing the lines of equal pressure are constructed from information received from various land stations and ships. The absence of information from any area does not necessitate a blank in the corresponding part of the chart. It means simply that that part of the system of isobars is filled in by guess-work and is less likely to correspond to the actual pressures in the area represented.\*

There are, then, a number of facts which are difficult to explain on the hypothesis that perceptions are built up out of sensations. These facts are, however, easily understood if we abandon that theory and suppose that a perception is not something produced by a stimulus but by the activity of the organism itself. The role of the stimulus may be supposed to be to control the perceptual activity of the organism in such a way as to bring it into practically useful relationship with the outside world.

The construction of a weather chart is probably a much closer (though by no means perfect) analogy to the process of perception than is that of telegraphic transmission of a photograph by a number of wires. A more commonly used analogy is that which compares the role of the sensory stimulation to that of the words spoken in a play which give an actor his "cue" that it is time for him to appear

\* L. F. Richardson has pointed out to me that the isobars over the sea in weather charts (being based on less information) are generally simpler in form than those over land areas. This is analogous to the observation of Fuchs that the figure completions on insensitive retinal areas tend to be of simple shapes; a circle is completed more easily than a square, and so on.

on the stage. The luminosity of the retinal image of the brightly lighted black paper in the brightness-constancy experiment is a "sensory cue" for the resulting perception of brightness. If it were the only cue, the resulting perception would be of an object of the same brightness as the shadowed white paper.\* There are, however, other cues, such as the position of the light and the outline of the shadow, which also have their effect on the apparent brightness of the papers and make the shadowed white paper appear the brighter. Similarly the apparent size and shape of seen objects are not the result only of the size and shape of the retinal stimulation but also of other cues such as those which also determine the perception of distance.

If this hypothesis is accepted, the sensation can no longer be considered to exist as a psychological entity. We can, of course, still perform the traditional experiments on "sensation" but the interpretation of these will be altogether different. These experiments are those in which the conditions of perception are so simplified that only one or a limited number of sense organs are stimulated at one time and in as simple a manner as possible. Whereas, however, it was at one time supposed that such experiments were discovering the ultimate elements out of which the experience of the outside world was built, it is now suggested that we are merely discovering how many different kinds of sense-organ there are. Such experiments would therefore belong to sensory physiology rather than to psychology.

It is known, for example, that by stimulating the end-organs of the tongue in various ways four and only four experiences can be obtained (sweet, salt, sour and bitter). Under the influence of the sensation psychology, investigators said, therefore, that there were only four taste sensations and that the complexity of flavours which men think that they obtain is simply an illusion due to their confusing taste and smell sensations. Psychologists are

\* A condition which can be realised by adopting any method of looking at the papers which eliminates these other cues as, for example, by looking at them with one eye through a blackened tube or through two holes cut in a piece of cardboard. Both papers then look grey, the brightness of the grey being wholly determined by the amount of light reflected from the papers.

now willing to admit that the complexity of flavours is a true fact of perception and that the experiments on the sensory sensitivity of the tongue simply show the physiological fact that this complexity is the product of the response of only a small number of different kinds of end-organ in the tongue and that the responses to the flavours of food are not determined by cues from these end-organs alone but also from cues obtained from the "smell" sense-organs.<sup>293</sup>

## 5. The Gestalt Theory

Criticism of the sensation theory and the provision of an alternative hypothesis to account for perception was carried out in the first place by a group of psychologists—Wertheimer, Köhler, and Koffka—whose distinctive hypothesis was called the *Gestalt theory*.<sup>130</sup> Many of the early contentions of the Gestalt psychologists have been very generally accepted by experimental psychologists, and are no longer distinctive of any particular school. Some of their views are speculations whose final confirmation or refutation by experimental research has not yet taken place. If we are to appreciate the importance of the Gestalt psychology in the development of modern experimental psychology, it is necessary to bear in mind that this is not merely a body of speculation but that it is also a great system of fruitful experiments about perception which would constitute a real contribution to psychological knowledge even if all the hypotheses which originally inspired them were shown to be false.<sup>132</sup>

Wertheimer had originally maintained that a perception was an immediate response to complex stimulation and was not a compound of the simple sensations which would be the responses to the elementary parts into which the complex stimulation could be divided. For those who accepted this contention, interest was shifted from the study of sensations to that of the principles of organization of the whole perceptual field. Such problems as those of movement, of shape, and of meaningful wholes became central for experimental research.

The perceptual field was seen to be organised in such a way that certain unitary parts stood out as wholes more or less *segregated* from the rest of the perceptual field. These segregated wholes were called *Gestalten* (or *configurations*). Thus if three equidistant dots are placed on a sheet of paper they form a segregated whole of triangular shape. If a large number of similar dots are added, this unification of the three dots may be lost and they may simply be elements in an irregular pattern of dots. In various ways they may be given back their Gestalt character—if they are joined by three straight lines, if they are painted a different colour from the other dots, or if they move in relation to the other dots while retaining their own relative positions.

Segregation of such a unitary whole in the perceptual field is not something that must exist either completely or not at all. It exists in various degrees. Wertheimer proposed certain laws specifying the conditions under which parts of the perceptual field would tend to form strongly unified and segregated configurations—similarity of parts, nearness of parts, the stability of simple configurations (such as the circle), etc.

The distinguishing feature of a Gestalt is that it is a whole whose properties are not those of the sum of its parts, but which has new properties of its own. Köhler has maintained that physical systems in dynamic or static equilibrium are Gestalten in this sense.<sup>287</sup> Thus the Gestalt properties of perception are not peculiar to psychology but are characteristic of all systems in which stresses between its parts determine the characters of the whole system (as, for example, in the distribution of charges over a system of condensers).

If this view of Köhler be accepted, it follows that the characters of the organisation of the perceptual field can be expressed in terms of forces between its parts. It can be regarded as a system in dynamic equilibrium, in which the properties of the parts are determined partly by the

forces created by the local stimulation, partly by forces existing between any part of the field and the remainder of the perceptual field, and partly by forces contributed by the perceiving organism. Forces of the first two kinds may be called "external forces," those of the last kind may be called "internal forces." An example of an internal force is to be found in the tendency to perceive the most stable and simple geometrical shapes in preference to complex and irregular ones, if the external conditions of perception are such that both are possible.

Koffka explains "constancy of shape" by supposing that when an ellipse is rotated about its short axis so that it gives a retinal image of a flattened ellipse but is nevertheless seen as a circular shape, this is because it has been rotated into a direction of phenomenal space in which there are stresses acting in the direction of the short axis of the retinal ellipse which tend to change the phenomenal shape from the retinal shape into one nearer to the real shape.<sup>132</sup> Perception in the absence of adequate sensory cues is simply perception determined primarily by internal forces. An interesting outcome of this line of thought has been Metzger's demonstration that perception determined by internal forces tends to be three-dimensional,<sup>301</sup> and that what is necessary to explain in the perception of the external world is not (as in traditional discussions) how certain stimulus conditions produce the perception of depth but how the perception of one-dimensional surfaces is produced.

One of the boldest of the Gestalt speculations has been that of the "isomorphism" of brain processes and mental processes. If Gestalt properties exist in physical systems, it is plainly possible that all the organisational characters of perception (and of all other mental processes) exist as similar organisational properties of the brain processes by which they are accompanied. The brain process in perceiving is thus considered to be a condition of dynamic equilibrium, whose organised properties are

those of the perception. Similarly all mental events may have the characters not of isolated local brain processes but of the whole pattern of brain processes that is going on at the time.

In Tolman's phraseology, both mental processes and the corresponding physiological processes must be conceived as "molar" and not as "molecular" phenomena.<sup>289</sup> The "sensation," the "reflex" of the reflexologists, and the "idea" of the associationist are all molecular principles of explanation. They are all used to explain complex wholes as aggregates of simple parts. If we treat perceptual configurations or behaviour systems as wholes with properties of their own, we are adopting, like the Gestalt psychologists, a molar principle of explanation. Mechanical theories of psychology have, in the past, been inadequate because they have been inclined to attribute to mental processes the simplicity of character which has been assumed for the physiological processes of the brain. Wertheimer has suggested, on the contrary, that mental processes are just as complex as they seem to be but that the corresponding brain processes must be equally complex.

## 6. The Outside World and the World of Appearances

We have already (in discussing constancy effects) found it necessary to distinguish between the "real" properties of objects (those which would be found by physical measurements), their "stimulus" properties (those which are characteristic of the particular way in which they are affecting the sensory organs), and their "phenomenal" properties (those which they have in appearance). Thus a distant large object is "really" larger than a near small one; if it is far enough away it may make a smaller patch of stimulation on the retina, but at a suitable distance it may be of the same apparent size—*i.e.* the sizes may be "phenomenally" equal. The world of our perception

is a world of phenomena. The biological purpose of perception is, however, to enable us to adjust ourselves to a "real" world outside us. There must be a sufficient correspondence between the characters of our phenomenal world and those of the real objects around us for this adjustment to be made. Although largely corresponding in structure, however, the phenomenal world and the real world are of a different order.

The outside world consists of objects, events, and of relations between these. There is a system of relationships between outside objects which we call physical space and a system of relationships between events which we call physical time. Although they serve the purpose of enabling us to orient ourselves with respect to physical spatial and temporal relations, the properties of phenomenal space and time are not identical with those of physical space and time. The phenomenal present, for example, as was pointed out by William James,<sup>113</sup> is not instantaneous but has a certain duration. Phenomenal space is not uniform in all directions but is (in Koffka's phrase) "anisotropic."<sup>132</sup> Much of the speculation about space and time in modern theoretical physics has consisted in the identification of properties of physical space and time which do not exist in phenomenal space and time (such as the possibility of treating time as a fourth dimension in space, the impossibility of asserting the simultaneity of spatially separated events, etc.).

If we are challenged by a philosopher to say why we believe in a real world of objects and events ordered in a physical system of space and time, we must argue from such facts as the possibility of obtaining measurements identical for all observers. Psychologically, however, the reality of the outside world is not of the nature of an inference. The "reality" character of objects is a primary element in our experience of them. It is the phenomenal accompaniment of the behaviour tendency to adapt our behaviour to the necessities imposed by external

objects. This sense of the imperatives imposed on us by the outside world may be called the "sense of reality." In certain pathological conditions (such as *dementia praecox*) this sense of reality is lost, and there results a mal-adaptation to the environment.

Although in this use of the word "real" we are adopting the usage of common speech (as when we speak of the "real" colour of a table in contrast with its "apparent" colour in a particular illumination) this usage is not free from objection. We certainly do not wish to imply that phenomena are unreal. Also the "real" world implies to many people the world of molecules rather than the world of chairs and tables. The fact that, when we contrast the "real" with the phenomenal world, we are using the word "real" in a somewhat special sense may be implied by putting it always in inverted commas.

It is perhaps better to use another word, and Koffka has ingeniously avoided the difficulties of the word "real" by speaking instead of "geographical" objects and their properties. In contrast with "geographical," he uses the word "behavioural." Apparently he adopts this term rather than "phenomenal" because the latter word has implications rather narrower than he requires and suggests mainly visual appearance. The behavioural object for Koffka is the object as it appears and as it elicits behaviour reactions from a given subject. The attractiveness of a face for example would be one of its behavioural properties. Similarly in social psychology we can distinguish the geographical characters of a group from its behavioural characters as they exist for any one person. Thus a group seems altogether different to one who is included in it and one who is excluded from it, yet "really" or "geographically" it is the same group.



## CHAPTER XIII

### THOUGHT AND LANGUAGE.—I.

#### 1. Behaviour and Thought

Behaviour is not necessarily an immediate response to external stimulation. Human responses, and probably those of the other higher mammals may be variously modified and even initiated by the internal events which we call processes of thought. Let us suppose that a man is given the task of opening a box with a locking device such as those on animal puzzle boxes. He will not begin by making random movements of different parts of the box and only open it correctly after unsuccessful movements have been progressively eliminated in successive trials. In an extreme case, he will make no movements at all except the correct ones. He may begin by sitting still and looking at the box for two or three minutes and then proceed at once to make correctly the necessary movements to open it. From the point of view of an outside observer, these minutes of stillness appear to be a period of complete inactivity. But, if we question the subject of the experiment, we find that this period has appeared to him to be one of great activity, although this activity has been of thought and not of explicit action.

Behaviour of an animal in which he accomplishes his object by trying out several lines of activity and so discovering which lead to the required end, is called "learning by trial and error."\* When a man achieves an end by a method in which explicit behaviour is replaced by thought processes, the method may be called that of "trial and error in thought." He may have thought to himself in words: "If I lift the latch before withdrawing the bolt,

\* p. 52.

it will be in the way of the bolt, but if I pull out the bolt first I can lift the latch afterwards . . ." and so on. Or he may have mentally pictured himself carrying out these actions and foreseen their results. He may, in other words, have carried out his trial and error either in words or in images.

A similar period of apparent inactivity followed by sudden solution of a problem was observed by Köhler in his chimpanzees.<sup>133</sup> The chimpanzee, faced by a task he could not at once perform (such as that of moving a box into a position from which he could reach bananas suspended from the roof), did not carry out random behaviour until he obtained a solution. He would sometimes after his first unsuccessful efforts, sit down, look puzzled, and scratch his head. Then his face would suddenly relax and he would get up and at once drag the box into the right position. He too seemed to have, in some manner, thought the problem out and to have understood its solution.

We have already seen that animal learning is probably very inadequately described by the "trial and error learning" formula. Still less is the case of the man working out in thought the way to open a puzzle box completely described by calling it "trial and error in thought." He is certainly not making random trials in thought of which the successful ones are selected. His solving of a complex puzzle will depend on his thought trials being not random but directed by an increased insight into or comprehension of the problem as a whole. Part of what is happening when he makes his trials is that his perception of the problem is being so reorganised that he sees into its nature as a whole. This progressive attainment of insight is the most important part of the contribution made by his thought processes to the solution of a problem.

The playing of chess might be taken as an example of trial and error by thought, since explicit trial and error is

prohibited by the rules of the game. It is true that in thinking out a move, thought trials are made. The player may think "If I move my queen there, my opponent will advance his pawn, and this will follow . . . ." If this is, however, merely random trying out of the immediate consequences of moves, the player will not be very successful. The value of such trials to the experienced player is that they contribute to his insight into the situation in the game as a whole. When he has this insight, the next move may be obvious; until he has it, mere trial and error will only help him to estimate the immediate consequences of his moves which will not carry him very far.

The range of thought processes which can modify human conduct is in fact so wide that it comprises all the psychology of cognition. By thought, a man is able to react to objects and situations distant from him in space and time. By his use of words, he is able to react to concepts which have no correspondence with any actually perceivable thing. His reactions to a given situation may, for example, be determined by his emotional associations to the concept of "justice." By his knowledge of logical and mathematical relationships, he can form connections between his images which lead to new mental attitudes of belief, disbelief, trust, etc., all of which affect his conduct. The behaviour of a man in danger of death by burning may be largely determined by the confidence he feels in the logical adequacy of the ontological argument for the existence of God.

It is agreed at the present time that we cannot properly treat human action as the product of motives which are determined by calculation. Such writers as Bentham exaggerated the influence of thought processes on conduct and neglected the powerful irrational influence of affective processes.<sup>22</sup> Both the psychology of instincts and of the unconscious are attempts to correct this overvaluation of the thought processes as determinants of behaviour. Yet it remains true that it is not possible to tell what a man will do in a given situation unless we know what he is thinking about.

It is certainly also true that thought processes may themselves to some extent be the servants of the affective forces behind conduct. Trotter has used the word "rationalisation" for the tendency to produce in consciousness a reasonable motive based on logical thought processes to account for action which has really

been produced by some unrecognised affective bias.<sup>253</sup> But even here thought processes have an effect on conduct, though it is not of the kind supposed by the man himself. A specious reasoned justification of dishonest conduct undoubtedly proceeds from the dishonest person's affective necessity for reconciling his conduct with his Ego-ideal, but the rationalisation is by no means without influence on his conduct. It enables him to go on being dishonest by getting rid of a conflict which, unless dealt with in that or some other way, would necessitate either the abandonment of his dishonesty or of his Ego-ideal. This is an indirect but none the less real modification of behaviour by thought processes.

## 2. Imagery

When the sense organs are stimulated by an external object we have perception; when, in thought, we revive perceptions we have previously experienced we have an "image." Thus, we can see "with our mind's eye" a picture of a scene not now actually present before us; we can hear "with the mind's ear" music or noises which we heard at other times; or we can sit in our chair and have the feeling of making the movements of swimming. These are examples of *visual*, *auditory*, and *kinaesthetic imagery* respectively.\*

One of the difficulties in the way of psychological investigation of imagery has been the very large individual differences in imagery. Galton was the first person by means of a systematic enquiry to show how great these individual differences were.<sup>84</sup> By sending out a questionnaire to a large number of people asking them to image their own breakfast tables and to answer questions about the colour, the brightness, and the clearness of the objects they could see on them, he found that some denied that

\* This imagery must be clearly distinguished from such sensory after-effects as the patch of green seen after the retina has been stimulated by a red object. These are unfortunately called "after-images," but are of an altogether different nature from memory images or the images of dreaming. The ambiguity is avoided in German by the use of the term *nach-bild* for our "after-image."

they had any such capacity at all, and these believed that no other person had. Others understood his question quite clearly and were able to perform the necessary operation and to answer his questions about it. Similar individual differences were found to exist in the power of mentally representing sounds and movements.

Galton divided his subjects into types possessing predominant *visual*, *auditory*, and *motor* (or *kinaesthetic*) imagery. These he called *visiles*, *audiles* and *motiles* respectively. Later investigation has shown that matters were not quite as simple as Galton supposed, but his main conclusion remains uncontradicted. This is that there are enormous individual differences in the range, vividness, and clearness of imagery possessed by different persons, so that some persons have, for example, no capacity for visual representation at all, while others have visual images of vividness comparable with that of actual perceptions.

Galton suggested that different equipments of imagery fitted their possessors for different tasks. He said that a 'person with vivid visual imagery might be able to perform such a feat as the memorisation of a long speech by imaging its actual appearance on the paper on which it was written, or to play games of chess blindfold.

Differences in literary styles have also been attributed to differences in imagery. The use of visual material in poetry (as in that of Shelley), or the use of visual metaphor in philosophical abstract writings, have been taken as evidence that their authors were of the *visile* type. Concreteness and a distrust for merely abstract thinking have been supposed to be characteristic of the person whose thought processes largely consist of visual images.

That such great differences in the structure of different individuals' thought should correspond with important differences in the kind of remembering or other mental operations they are able to perform, is a reasonable suggestion. It has not, however, been confirmed by experimental enquiry. Such enquiry has failed to reveal the

predicted correlation between the mental powers of individuals and their imaginal types.

A good example of failure of a mental ability to show its expected dependence on the use of imagery is the following experiment which was carried out by Betts<sup>20</sup>. He asked his subjects to suppose that a wooden cube painted red on the outside was cut into twenty-seven cubes, and to say how many of these smaller cubes would have paint on three faces, how many would have paint on two faces, and how many would have no paint on them at all. Afterwards, he questioned them in order to find out what imagery they had used in solving the problem.

This is the kind of task which one might expect to find could be solved only by the use of visual imagery. This experimenter found, however, that 85 per cent. of his subjects reached the solution without the use of imagery, and that these made as good records in accuracy and speed as did those who reported the presence of imagery. This result suggested that the imagery even with those subjects who reported its presence was an incident rather than a necessary factor in the obtaining of the solution. Similar experiments have been made by Carey, who worked out mathematically the correlations between the performance of tasks which have been supposed to be dependent on the presence of visual imagery, and the actual presence of such imagery.<sup>48</sup> The correlations were found to be extremely low (.13 and .06 in two series of experiments).

The principal extension of knowledge about imagery since the time of Galton has been Jaensch's distinction of a type of visual imagery which he calls *eidetic imagery*.<sup>112</sup> This is found amongst a certain proportion of children, generally (although not always) disappearing in later life. It differs from the typical visual image in its greater stability, in its occupying a position in the space in which external objects are seen, and in the possibility that the subject may report from the image a detail which was not noted in the original perception of which it is a revival.\*

When we read Galton's account of visual imagery in the light of Jaensch's work, we find that he was sometimes

\* In all of these respects it resembles the *primary memory image* found commonly, but not in all people, for a second or two after the cessation of a perception.

describing eidetic imagery without realising that this was different in kind from the visual imagery of other subjects. He speaks, for example of people mentally reading from their manuscripts when making speeches, and mentions a statesman who attributed certain hesitations in speech to the effect of corrections in his original manuscript (a point strongly suggestive of eidetic imagery). In conversation, I have heard Blackburne describe his method of playing simultaneous blindfold chess in a way which can leave no doubt that he employed eidetic imagery. He said that he had a mental picture of the board on which he was playing, that he made a move on it as he would on an actual board, and that he found the pieces on it in the position in which he had left them when he returned to the image of that board after having played on the others. He mentioned that if he started a game with one of his boards in the wrong position (with a white square at the left-hand corner) it remained so throughout the game. He could not alter the image while the play was in progress. On the other hand, Zukertort, who had equal powers of blindfold simultaneous play did not, I believe, use a visual method.

It is probably generally true that abnormal powers of visual remembering are always the result of the employment of eidetic imagery. With this exception, there is no evidence that the power of imaging visually confers any special superior ability in remembering or any other intellectual task to its possessor. If such abilities exist, they have not yet been discovered. It seems most likely that the visual image, although a striking feature of the phenomenology of the thought processes, is functionally unimportant—that the effectiveness of the traces employed in visual remembering is not influenced by whether or not their activity is accompanied by the appearance of a visual image.

The apparent functional unimportance of visual imagery is a principal reason for the decline of psychological

interest in the subject of imagery. Some psychologists have even gone so far as to deny that the visual image exists even as a thought phenomenon.<sup>268</sup> This cannot reasonably be upheld. The reason for the opinion is probably that discovered by Galton himself, that some persons have no visual imagery and yet know themselves capable of remembering visual facts, and are unwilling to believe that the representation of past visual events in the minds of other persons takes a different form from their own.

On the problem of how far the behaviour of animals is influenced by thought processes, we know unfortunately very little. This is not a meaningless problem since, although we can never have access to any account of how the animal's mental processes appear to the animal itself, it is perfectly legitimate to enquire whether the animal's behaviour is such as to indicate immediate reactions to external stimulation or whether it shows characters which suggest something of the same nature as our own images or other processes of thought. If the animal had images with no influence on its conduct (like those of our own day dreaming) these would be for ever shut off from the possibility of being investigated.

While we cannot observe an animal's images, we can find out whether the animal's behaviour is determined only by objects present to its perception or whether it can also react to objects which are no longer present but past objects of perception. Experiments have been done on this subject by the method known as that of "delayed reaction," in which food is placed in one of a number of receptacles while the animal is looking on, but he is not released until some measured time after the concealment. Köhler found that chimpanzees went straight to the place where food had been buried even after a delay of seventeen hours.<sup>133</sup>

The capacity for such behaviour varies enormously in different animals, being much greater in those with highly developed nervous systems. Animals below the monkeys find great difficulty in performing delayed reaction tasks. The behaviour of the domestic hen towards concealed food, for example, is in striking contrast with that of the monkey.<sup>199</sup> If a monkey sees a tit-bit put into a piece of paper or box, he will continue to make efforts to get at it. If his attention be diverted to something else before



he has achieved his object, he may return later to his task with unabated ardour. The hen, on the other hand, when she sees grains of corn covered by a piece of paper makes only a few random scratches on the top of the paper, and soon ceases. She does not make the very simple movements of beak or feet necessary to push the paper off the grains, and only in fact picks them up if they are accidentally uncovered.

The stimulus necessary to determine the reaction of a hen is *an optical impression actually present*; for a monkey it may be an optical impression once present but now past. We may be tempted to say that the monkey is moved by a visual image of the food he has seen concealed, but about this we cannot be certain. We know that human behaviour can be influenced by some kind of mental after-effect of past experiences which need not appear in consciousness as a mental image. Let us call this after-effect a "trace."\* We must say then that the monkey has a "trace" which leads him so patiently to unwrap the food. In attributing this behaviour to a "trace," however, we have asserted nothing about the contents of the monkey's consciousness, only about his behaviour. Whether the activation of a memory trace gives the monkey the conscious experience of a visual image, is a question we shall not be able to answer until we have the introspections of the monkey.

### 3. Experimental Investigation of the Thought Processes

An obvious question which arises at this point is whether that part of the content of the mind which is not perception is composed entirely of images of various kinds or whether there are also elements of thought which are not images.

It is, of course, no answer to this problem to say that thought without images must be possible since we can also think in words. This is true, but a word also may occur in thought as an image. Sometimes (although not commonly) words are thought of as visual images of their written appearance, more commonly either as auditory images of their sounds or kinaesthetic images of the movements of the vocal apparatus which would be made in

\* The term "image-function" has also been used.

pronouncing them.\* We must, therefore, distinguish between *verbal images* and the *concrete images* which are mental representations of objects of sight, hearing, etc., such as were investigated by Galton.

There remains the problem as to whether there are other contents of thought than concrete and verbal images. This is a question which can be decided in one way only, by careful introspective examination of the thought processes.

The examination and exact description of thought processes is not a matter as easy as it may at first sight appear, and it was not until the beginning of the present century that such observations began to be made in a way which made it possible to give a reasonably certain answer to this question. The method used was that the subject was asked to solve a simple problem, to make a judgment, to grasp the meaning of a sentence or to answer a question, and immediately after his answer was given he was required to report all that had passed through his mind during the few seconds between the posing of the problem and the finding of the answer. These operations were repeated again and again with the same subjects, until the task of reporting their mental processes which was difficult at first became relatively easy.<sup>251</sup>

One of the most important results which emerged from these experiments on thought processes was that a description of the sensations and images (verbal and concrete) did not complete the observable contents of the mind. There were other elements in the processes of thought which, since they were thoughts and yet were not images, were called *imageless thoughts*. For example, when a subject is given the task of responding with its opposite when he is shown a word, he is in a condition of mental tension

\* It is possible that all so-called kinæsthetic images are really perceptions of small movements made in the muscles, and that the kinæsthetic images of words are the perception of small movements of the vocal muscles made when we are thinking in words. This was maintained by Watson.<sup>255</sup>

which might be expressed in the words: "opposite to be called out when word is exposed." This tension may not appear in consciousness as a form of words or even as an image. It is simply the awareness that a particular problem has been set which the subject understands and could put into words if required. It is a mental fact which must be expressed by a new word. The word used in German is *Aufgabe*, which may be expressed in English as *consciousness of a problem or mental set*.

Another kind of imageless thought was called in German *Bewusstheit*, in English an *awareness*. If we use a noun, let us say *horse*, it carries as its meaning indication of a class of objects (a particular kind of four-legged animal) with a certain amount of knowledge that we possess about them—that they are used for drawing carts, have manes and tails, and so on. This body of knowledge is what we call the *meaning* of the word "horse," but these experiments prove that this meaning can be present in the mind without the word "horse," or the image of a horse, occurring at all. Similarly the meaning of the word denoting a relation, let us say "higher," may be conveyed in the mind by the image of the word or by an image of two objects, one of which is above the other, but it may also occur as a thought without either verbal or concrete image accompanying it. Such imageless thoughts are what is meant by an *awareness*. They are imageless presentations of a knowledge-content.

The central conclusion that can be drawn from these experiments is that a great part of the process of thinking is not composed of definite images. Indeed imageless thinking seems to be the main substance of our thought. It has been pointed out by T. V. Moore,<sup>186</sup> that images, when they occur, may not be performing an essential part in the process of thinking but may be somewhat discrepant to the thought; they may play a part somewhat analogous to that of the illustrations which accompany the printed matter which conveys a narrative or argument. Images

are particularly liable to occur in the mind when there is some interference with the train of thought, as when there is a difficulty in proceeding to a conclusion or when we deliberately stop the train of thinking to examine some point more carefully. Thus, Aveling says: "Thought is perpetually in process of becoming, in which process it passes beyond itself. It is unstable. The image is a relatively stable formation; and as long as it is present in consciousness its conceptual element will also tend to remain."<sup>10</sup> This is also the conclusion to which James came in his famous chapter on "The Stream of Consciousness" in which he says: "Like a bird's life, it seems to be an alteration of flights and perchings . . . . The resting-places are usually occupied by sensorial imaginations of some sort . . . the places of flight are filled with thoughts of relations."<sup>11</sup>

Like the subject of imagery, imageless thought has ceased to be a matter of great current interest in psychology. This is partly because these experiments settled conclusively one side of the problem of thought—that of its phenomenology or of how thought appears to the thinker. The decline of interest has also partly resulted from the fact that their attempt to contribute to the functional problems of thought—of how thought works—appeared to be a blind alley. These experiments were started under Külpe at Würzburg in an attempt to supplement the inadequacies of associationism. They seemed to reveal a determining force appearing in consciousness as the "mental set" which must be postulated in addition to forces due to association in order to account for the meaningfulness of the results of thought processes \*

This patching up of the theory of associationism by the addition of such determining forces, has, however, seemed a solution of the problem insufficiently radical to other experimental psychologists

\* To account, for example, for the fact that to the question "What is seven times eight?" we can give the answer "Fifty-six," it is necessary to postulate a determining force set into action by the first part of the question "What is seven times . . . ?" Without this determining force the reply would be the number with the strongest associative bonds with "eight" which is undoubtedly "nine."

who are convinced that advance in the knowledge of the thought processes requires us to abandon the theory of associationism altogether except as an account of the mechanical and automatic tendencies of reproductive thinking. Also it has seemed that introspection (which alone can give us knowledge of the phenomenology of thought) is an unreliable guide to the causal connections of the thought processes, so that introspective methods of enquiry must be replaced by experiments of a more objective nature, in which the subjects of the experiments are given problems to be solved by thought and the experimenter draws his conclusions from the results of his subject's thinking and not from the subject's account of how this appeared to him.

Nevertheless, in the study of thought as in that of perception, progress in functional problems may be retarded by inadequate study of its phenomenology. The findings of the imageless thought experimenters have formed a real step forward.

#### 4. Language and Conceptual Thinking

Many animals have means of communication by which the end of concerted action may be attained. Communication between ants is stated to take place by the mutual tapping of the antennae. Most commonly the greater part of communication is by means of cries. These cries are not a language since they are capable only of communicating the simplest things, such as: danger, challenge, etc. With a more flexible vocal apparatus, man has elaborated his cries into a system so efficient that by their means he can attain such complex social co-ordination as that of a moving army, or can communicate to his fellows a theory of the universe. Also he has in many cultures devised methods by which the visual symbols of writing can be used as equivalents to the auditory symbols of language and serve the same ends of promoting social co-ordination. In some cultures, he has also devised gestures which may be used either as accompaniments of or as substitutes for the vocal communication of language.

The symbolisation of meanings by successions of significant sounds is not, of course, the whole of language,

although it is all that is dealt with in dictionaries. Changes of intonation, which in some languages (such as Chinese) modify the logical meanings of words, in our own language convey only indications of emotion and of attitude. We do not fully understand the speech of a people unless we can respond to these differences as well as to those which express differences in dictionary meanings.

The acquirement of language begins with the child's play activity of babbling in which he repeats a much larger number of sounds than those which are given significance in his own language. Under social influence, he employs a limited number of these in words and sentences which are finally those of the adults around him although in an early stage many may be elements of a private language of his own.

It is sometimes said that the stresses which lead him to the use of language are those of commanding adult behaviour to satisfy his needs. My own experience with young children convinces me that this is not altogether true since a large part of their talking in the first months of speech is of the nature of commentary on outside events and not of imperatives (these cases can easily be distinguished by the absence or presence of bodily expressions of tensions and by the fact that unfulfilled imperatives cause repetition and finally the violent reaction to frustration). The prevalence of this "commentary" use of language is probably to be explained partly by the fact that early speech is, in Groos's sense, a play activity, (indulged in for its own sake and not for the attainment of external ends),<sup>33</sup> and partly by the fact that such external ends as are aimed at by the child, are those of establishing social contracts with other persons as well as the end of satisfying primary needs.

The functions of words are twofold. First, to provide a system of symbols communicable from one person to another. We might do our own thinking fairly satisfactorily in concrete imagery, but if we had not words we

could make only very clumsy attempts to communicate ideas to each other. Secondly, to provide a vehicle in which our own thinking can be carried on in a manner more precise and better adapted to the resolving of problems requiring precision of thought than is possible with concrete images. The important contribution to thinking which is made by words is its extension of the possibilities of conceptual thinking—giving not merely the possibility of thinking of classes of concrete objects but of classes of classes to any degree of abstractness.

The first step in conceptual thinking is that of thinking of classes of concrete objects. For this degree of conceptual thinking, words are certainly not essential. The meaning of the whole class of dogs may certainly be carried by the word "dog," but it may also (as was pointed out by Aveling)<sup>10</sup> be carried by a concrete image, either one that is vague and schematic or (in a good visualiser) one that represents the shape, colour, etc., of a particular dog, but which, nevertheless, is serving the function in thought of representing the whole class of dogs.\*

Aveling found in his experiments on conceptual thinking that his subjects generally only used concrete images in thinking about particular objects. Their use as thought indicators for classes of objects has obvious disadvantages since they tend to frustrate the aim of thinking generally of a class by tying thought to the particular case.

\* The old philosophical controversy as to whether we can have *generic ideas* or whether we are confined to particular ideas mainly rested on different uses of the word "idea" which probably themselves resulted from differences in the imaginal types to which the controversialists belonged. Those who denied the existence of generic ideas were probably good visualisers whose mental pictures were so accurate that they could only represent at one time the characters of particular objects. Since, however, such images can serve the function of conveying generic meanings, and since these meanings can also be carried in thought by words or by an imageless awareness, the defenders of the possibility of generic ideas would seem to have the best of the argument.

As, moreover, we go further from thought about everyday objects, the value of words as vehicles of thought increases. It is difficult to see how a visual image could satisfactorily carry the meaning belonging to the word "instinct." Any use of a visual image for conveying this meaning would be liable to lead to confused and inaccurate thinking, while such a word as "entity" could not be given any concrete visual form.

The compensatory disadvantage of verbal thinking is that it may lead to the use of abstract terms which have no meaning, but which are used as counters in a kind of verbal game of abstract thinking which has its own rules but has no reference to anything outside. This danger may be avoided in abstract social intercourse (as in a lecture) by the giving of concrete examples of abstract statements. Similarly, it may be avoided in private thinking by the illustrative use of concrete images to supplement abstract verbal thinking. Thus both verbal and concrete imaginal processes may play a useful part in abstract conceptual thought.

The definiteness and fixity of the meanings carried by words may itself tend to produce a falsification in the descriptions carried out by their means and may even affect the character of perceptions. We find it difficult to recognise the differences in phenomena we describe by the same word, or to see the continuity between things which are called by different names. The child finds it difficult to make a distinction between, let us say, "scarlet" and "crimson" as long as he brings both of these colours under the more general word "red." Later, when as an adult he possesses an increased number of colour names, he thinks of the colours as distinct things. If he recognises the difference between scarlet and crimson, but has no intermediate colour name, he will recognise an object as either scarlet or crimson, and not consider them as arbitrarily chosen points on a scale of colour which is



absolutely continuous from a red with a slight admixture of yellow to one with a slight mixture of blue.

The falsification which results from the artificial appearance of discreteness given to continuously varying phenomena by the application to them of words (which by their very nature must be distinct and separable) is a particularly grave danger to psychology. Where there are no sharp divisions in nature, we may make divisions when we try to describe phenomena in words. The words "sane" and "insane"; "intelligent" and "backward"; "good memory" and "bad memory"; are pairs of words which in popular speech stand for distinct and separable conditions, although psychological research shows that there is absolutely continuous gradation between them.

The fact that conceptual meanings may be carried as imageless thoughts does not make words unimportant in thought. In the ordinary flow of the thinking process, it is probable that definite words are uncommon. It often happens, however, that we want in our thinking, not merely to reach conclusions, but to know whether the conclusions reached are justified. Conclusions may be reached by the passage through consciousness of imageless thoughts, but the test of logic can only be applied to a series of thoughts which has been expressed in words. Verbal thinking is, therefore, used when we wish to be careful of the validity of our thought processes.

Finally, it is possible that thoughts were originally carried by words or images, even though in the process of individual development they have later grown independent of them. An initial dependence of thoughts on words is, for example, suggested by the autobiography of Helen Keller who, blind and deaf from a very early age, never had the use or understanding of words until they were communicated to her by the patient tapping on the palm of her hand by a teacher of the blind and deaf.<sup>128</sup> She

describes her feelings when the meaning of a word dawned on her for the first time. She speaks of the word awakening her soul, giving it light, hope, joy, and setting it free. Something very definitely new clearly entered into her mind at this time; her language suggests that words meant for her not merely new vehicles for old thoughts, but the possibility of thinking new thoughts altogether. Her initiation into the use of words seems to have meant the beginning of clear conceptual thoughts. The meanings which may afterwards have been independent of words only became possible to her mind when words came to carry them.

It is sometimes said that conceptual thinking is a purely human achievement because it depends on the use of language. The first step in conceptual thinking is the forming of groups of particular objects into classes, and the behaviour aspect of this mental achievement is the capacity to react in a certain way to all members of the same class. This capacity certainly develops at a lower level of mental evolution than that of man. We may consider, for example, the following experiments by Lloyd Morgan on chicks <sup>168</sup>

To some chicks he threw cinnabar larvae, distasteful caterpillars, conspicuous by alternate rings of black and golden yellow. "They were seized at once, but dropped uninjured; the chicks wiped their bills—a sign of distaste—and seldom touched the caterpillars a second time. The cinnabar larvae were then removed, and thrown in again towards the close of day. Some of the chicks tried them once, but they were soon left. The next day the young birds were given brown loopers and green cabbage-moth caterpillars. These were approached with some suspicion, but presently one chick ran off with a looper, and was followed by others, one of which stole and ate it. In a few minutes all the caterpillars were cleared off. Later in the day they were given some more of these edible caterpillars, which were eaten freely, and then some cinnabar larvae. One chick ran, but checked himself, and, without touching the caterpillar, wiped his bill—a memory of the nasty taste being apparently suggested by association at sight of the yellow-and-black caterpillar. Another seized one, and dropped it at once. A third subsequently approached a cinnabar as it crawled along, gave the danger note, and

ran off. Then I threw in more edible caterpillars, which again were eaten freely. The chicks had thus learnt to discriminate by sight between the nice and the nasty caterpillars."

The following experiment was made with another group of young chicks. "Strips of orange and black paper were pasted beneath glass slips, and on them meal moistened with quinine was placed. On other plain slips meal moistened with water was provided. The young birds soon learnt to avoid the bitter meal, and then would not touch plain meal if it were offered on the banded slip. And these birds, save in two instances, refused to touch cinnabar caterpillars which were new to their experience . . . I have also found that young birds who had learnt to avoid cinnabar caterpillars left wasps untouched. Such observations must be repeated and extended . . . they afford evidence that black and orange banding, irrespective of particular form, may constitute a guiding generic feature in the conscious situation."<sup>169</sup>

The chicks had thus developed a particular way of reacting towards a class of objects distinguished by alternate black and yellow strips. This black and yellow had been disintegrated from other perceptual elements, for black and orange banding was responded to irrespective of other elements in the perception (for example, form), and all objects with this *black-orange banding* quality were refused. The chicks' behaviour was, in fact, just that which would have resulted from the formation of a concept of a *black-orange banded* class of objects which were not good to eat.

An investigation directed towards the problem of how far rats were able to form such concept reaction patterns was undertaken by Fields.<sup>75</sup> He showed clearly that by training rats to react differently to circles and to triangles, it was possible for them to show these different reactions to any member of the class of triangles and circles, even if different in structure from the particular figures with which they had been trained.

It is obvious that we cannot know how the recognition of a new object or figure as belonging to a class demanding a special type of reaction appears to the consciousness of a chick or of a rat. We can only demonstrate that they show concept reaction patterns. We may express this by saying that they can form a "compound trace" for that class or that they form a "concept function." This capacity to react distinctively to a class probably precedes in mental evolution the capacity to think in concepts.

## CHAPTER XIV

### THOUGHT AND LANGUAGE —II.

#### 1. Social Functions of Language

Although the use of words has an important use in the enriching of individual thought by extending the possibilities of conceptual thinking, its primary purpose is that of providing an exact and flexible means of social intercourse which extends the possibilities of effective social co-operation.

The simplest kind of meaning which a word can bear is some object, event, or relation in the outside world. This kind of meaning is called by Ogden and Richards *reference*, while the thing to which a word refers is called its *referent*. If reference to external things and statements of relations between them or of the occurrence of external events were the only uses to which words or sentences were put, the psychology of meaning would be a fairly simple problem.\* But we soon discover that words or sentences having the same reference may differ very much in meaning, because the form of words used expresses something besides a reference. It may express, for example, an emotional attitude towards the object or event referred to. The words *firm* and *obstinate*, *brave* and *foolhardy*, *thrifty* and *mean*, for example, are pairs of words generally used to refer to the same qualities of character, but in each pair the first expresses commendation, the second condemnation of that trait. Even when using the same word (let us say, *clever*), the intonation of it may express attitudes

\* Sentences and phrases, rather than words, must, of course, be regarded as the units conveying meaning in ordinary speech. We shall generally speak of the meanings of single words because these present the same problems in a simpler form.

of approval or severe disapproval. Ogden and Richards distinguish five ways in which language is used:<sup>178</sup>

(1) Symbolisation of reference.

(2) The expression of the speaker's attitude to the listener. (As, for example, when the avoidance of slang or common-place words expresses respect to the listener, while the use of those words would express familiarity.)

(3) The expression of an attitude towards the referent. (Examples have already been given of words used in this way.)

(4) The promotion of effects intended.

(5) Support of reference. (Indication of the degree of difficulty in recalling experience referred to.)

Of these five uses of language, in addition to simple indication of referents, the expression of an attitude to the referent is unquestionably very much the most important. In fact, one of our prime difficulties in constructing a suitable terminology for psychology is to use words which merely indicate mental facts without expressing also attitudes of approval or disapproval. If we take by chance six words in psychology, let us say, *character*, *will*, *passion*, *instinct*, *intelligence*, *intellect*, we shall find as we examine each one that its connotations are partly ethical judgments of approval and disapproval, quite irrelevant to the work we want the words to perform in a strictly scientific psychology. The construction of a scientific psychology requires us to abstract the meanings of our words from such attitudes, and to use words simply as indicators of mental facts.

Our difficulty is rendered greater by the fact that, in the world outside, words tend to accumulate more and more the meanings of approval and disapproval in addition to their mere function of symbolisation. Politicians and the writers of leading articles in newspapers, whose use of language is primarily to foster sentiments and not to attain scientifically exact description, use words with this expression of attitude as the most important element in their meanings. Indeed, one could construct a reasonably

adequate political speech by merely collecting all the words expressive of disapproval and applying them to one's political opponents, and of the words expressing approval and applying them to one's own party. In the construction of such a speech one need only do so much indication of actual events as is necessary to provide a stream of language in which these words could be used.

Our ideal in science and logic is to use words so that they symbolise merely objects, events, relations, or concepts, and express no mental attitudes. Our second ideal is to use words which mean exactly the same thing to everyone using them. Neither of these ideals is completely attainable. Words used in scientific treatises are approximately devoid, to the scientific reader, of expressions of attitudes. They are not, however, for the general reader who picks up the scientific work, and much of the misunderstanding of modern psychological work is due to the fact that words used by the writer with an approximately scientific meaning are read by the general reader and understood with all their popular meaning of expression of attitude.

But even apart from this source of difference of meaning between the user of a word and the hearer of it, there is a source of individual difference in meaning in the mere fact that the user and the hearer of a word have had different individual experiences from which their meanings have been built up. Even when I use the word *dog*, its meaning for me is not quite the same as it is for my reader because my experience of individual dogs has been different from his.

This difference in common nouns is clearly of no practical importance, but when I use such words as *capitalism*, *religion*, *communism*, or *morality*, it is unlikely that they mean even approximately the same thing for different readers. If the speaker is allowed time to explain what he means by one of these words, he may be able to convey this meaning very nearly to his hearers, but when they are used simply as individual words in a continuous flow of speech, the user of them has no opportunity for

such elaboration, and the common assumption that the meaning of them to a speaker and to his different hearers is the same is quite certainly wrong.

It must be obvious to anyone who has carefully observed himself or other people in conversation that language may serve other social ends than those of promoting effective co-operation and communicating ideas. In ordinary conversation, particularly between people not well acquainted, it is quite obvious that the speakers are driven by a necessity to talk to each other which is almost independent of the ideas communicated. So subordinate are these, in fact, that the meanings conveyed are often as well known to the hearer as to the speaker.

The logician who supposed that the only function of language was the communication of ideas by the indication of referents, would be puzzled if he heard one man, meeting another in the street, tell him that it was a fine day. For this use of language in which the social function predominates and the conveyance of meaning is altogether subordinate, Malinowski suggests the term *phatic communion*.<sup>178</sup> Perhaps one object of such phatic communion between strangers is the recognition of whether both belong to the same social group. Observation of intonation and pronunciation decide whether one is to treat the stranger as an equal or to remain aloof from him. But probably this is not its only function. The mere establishment of social relationship, which takes place by speech and is impeded by silence, is probably the important function of phatic communion.

## 2. Remembering and Forgetting

Any constituent of thought—a concrete image, verbal image, or an imageless thought—may fulfill the function of standing for past experiences. A motor habit also may provide a point of contact with past experience, and the establishing of contact with past experience by the use of motor habits is included in the ordinary meaning of the

word "memory." Thus when we have formed the laryngeal habit of repeating a series of nonsense syllables, we say that we "remember" them, using the same word as of our ability to reproduce the gist of a book we have read, although in the latter case there has been no formation of laryngeal habits by repetition and probably no exact reproduction of the original. These have generally been distinguished as "mechanical" (or "rote") and "logical" remembering respectively.

It must be borne in mind that an image is not a memory image by virtue of being a copy of past impressions. It may well be both an inaccurate and an incomplete representation of a past perception. It is a memory-image in virtue of the fact that its function in thought is to *mean* a past experience. Similarly, an image which *means* a situation or object which is thought of as belonging to the future is an image of the *imagination*, although it may be no less like past perceptions than a true memory image. The difference between these two kinds of imagery is a difference in their function, not a difference in the material from which they have been made up. This is equally true, of course, of any other constituent of thought than the image.

That an activity or perception now past is able to be revived in thought, makes it necessary for us to suppose that the original activity or perception has left some enduring change in the organism which accounts for this potentiality of revival. This enduring change is generally called the "memory trace."

If all that it was necessary to account for in remembering were the revival of particular perceptions or activities, it would be necessary only to suppose that each particular activity or perception of the organism left its own trace and that these traces could be made active in those conditions which led to remembering. It is rarely, however, that remembering involves only a single activity or perception; more commonly it is a group of such experiences to which the present experience is related.



Let us suppose, for example, that we are trying to remember what a hedgehog looks like. We have seen in our lives not one hedgehog but many. The trace which is activated must be compounded of the many perceptions we have had of hedgehogs of different sizes and in different positions. The case is not really different when we are remembering a particular object. I have seen Mr. Jones's face from many angles and with many different expressions. Any activity of remembering him will utilise a trace compounded of many different experiences of him, but not containing any of my experiences of Mr. Brown or of Mr. Robinson.

A very large proportion of the everyday activities which we should classify as "remembering" involve such compound traces and a psychology which treated remembering only as a matter of the activation of simple traces left by single experiences would give a very inadequate account of the matter. Such compound traces are called by Koffka "trace-aggregates."<sup>132</sup> F. C. Bartlett gives a very similar account of remembering but rejects the word "trace" because it suggests too much the explanation of memory as an effect of residua of single experiences,\* and uses instead Head's term "schema."<sup>291</sup>

The forming of a compound trace is a process in which there is interaction between a present perception and a previously existing trace system. There is a difficult problem (which we must here leave on one side) of what determines the particular trace or systems of traces with which a particular present perception interacts. Why, for example, does each successive experience of Mr. Jones's face contribute to the same compound trace and not to those of the faces of Brown and Robinson. Similarity seems obviously to be one factor. If Jones and Brown resemble each other very much my memories of

\* And also because it suggests a passive view of memory in which the mind or brain is thought of as a "storehouse of past impressions."

them may form part of a single compound trace so that I am inclined to confuse them. Similarly there is a tendency for many people to form a single compound trace representative of mice and rats, so that a mouse is always recognised as an unexpectedly small member of the mouse-rat class and a rat as an unexpectedly large one.\*

The existence of traces is not an immediately observable mental fact, it is a hypothesis to account for several different kinds of observable mental fact:

(1) The activation of a trace either by a present perception or by a train of thought may lead to the appearance in the mind of a concrete image. This may be clear and detailed and representative of a single perception or vague and schematic and representative of many perceptions whose individual characters have been lost in their combination in a compound trace, or it may be, as we have seen, clear and detailed but nevertheless functionally representative of a compound trace.

(2) A trace may be similarly activated without giving rise to a concrete image. The experience of such activation is an imageless thought.

(3) The activation of a trace by a present perception may give rise to the process of recognition with the accompanying experience of familiarity.†

\* In the same way, it has been suggested that the difficulty of learning series of nonsense syllables is the result of the fact that their similarity leads them to tend to form a compound trace representative of all of them whereas the task required is to reproduce them separately.

† This activation of a trace by a present perception is the minimum that any theory of recognition must assume. That it is not a complete theory is shown by the fact (observed by MacCurdy<sup>292</sup>) that a psycho-pathological patient (suffering from the Korsakoff syndrome) may correctly point to the one of a list of names which is that of the physician but without any feeling of familiarity. It seems to him to be a mere guess. There is connection between trace and present process but no recognition. Koffka maintains that what is here lost is the connection of the trace system with the Ego.<sup>132</sup>

Thus the statement that I have a compound trace or schema of Jones means one or more of the following three facts: that I can call up a visual image of his face, that I can think about him without having a visual image, and that when I see him, I recognise him. The experiments described earlier on the functional unimportance of concrete imagery show that those individuals whose traces do not lead to the first of these results are not handicapped in attaining the second and third. The possibility of calling up a concrete image is no doubt indicative of the existence of a trace system, but the absence of this power does not indicate the absence of a trace system.

The communication with our past provided by persistence of motor habits and of memory traces is not permanent. The power of recall passes away in the course of time, and this passing away is known as *forgetting*. There is no evidence for the popular idea that all memories are retained for ever "subconsciously." There is, on the contrary, every reason for supposing that many memories are obliterated completely. The slow fading of memories which takes place through their slight interest and through the lapse of time is known as *obliviscence*. The course of obliviscence was shown by Ebbinghaus (using memorised nonsense-syllables as his material) to be rapid at first, and then progressively slower.<sup>280</sup> A graphical representation of this course is known as the "curve of forgetting."

The loss of effectiveness of traces through the passage of time is certainly not the sole cause of forgetting since other investigators have found that there is an element in forgetting which is not directly dependent on lapse of time. It has been found, for example, that after a learning task very much more is lost if the interval is filled with the ordinary tasks of the day than if it is spent in sleep.<sup>56</sup> Since the time interval is the same, it must be the different ways in which the time has been spent that have determined

the greater forgetting in one case. This suggests that a large (perhaps a main part) of the forgetting commonly attributed to obliviscence is really due to a factor described by Ebbinghaus as *retroactive inhibition*—the tendency of later tasks of the same kind to inhibit the effectiveness of previous learning. *Retroactive inhibition* has itself been explained (by Kohler and Restorff) as a result of trace aggregation, the earlier traces become ineffective to perform their specific tasks of recall because they have become aggregated to later traces.<sup>132</sup> Thus if we learn a list of words so that we can repeat them correctly, we may fail to repeat them correctly a few hours afterwards not because time has weakened the traces but because they have become organised with other traces formed later so that their individual character has been lost. If we had slept during the interval, no new traces would have been formed so that we might have been still able to repeat the list correctly.

In addition to this, there is probably an active process of expulsion of painful memories from the mind by repression (as maintained by Freud). Some incidents of a painful kind, such as the incident of River's claustrophobic patient and the dog,\* are completely obliterated from the mind within a short time of their occurrence, but retain their power of influencing conduct. Repression (like the other kinds of forgetting) is not a process under direct voluntary control. There is no evidence that all forgetting is of the nature of repression, although this has sometimes been maintained

### 3. Phantasy Thinking

We have already described one kind of thinking, in which concrete images, words and imageless thoughts pass through the mind under conscious direction with a consciously chosen purpose. The purpose may be to find out the best way of opening a puzzle-box, to solve a mathematical problem, or to decide in conversation what to

\* See p. 72.

say next; all such problems are decided by consciously controlled processes of thought.

Sharply opposed to this is the kind of thinking which takes place in conditions when we have lost interest in the environment and its problems, and indulge in day-dreaming or reverie. In these conditions, the conscious control of the processes of thought is relaxed, and the thoughts are left to follow each other as they will. The first form of thinking we may call *controlled thinking*, the second *phantasy thinking*. The characteristic features of phantasy thinking are its relative detachment from the environment and from any tendency to result in action, the absence of voluntary control over the course of thought, and the tendency to a relative predominance of concrete over verbal imagery in the actual content of thought.

Its main function seems to be compensatory. We can live in a smoky industrial town and save ourselves from the depressing effects of our surroundings by indulging in dreams of green fields and open country. We can be employed in a monotonous job with no prospect of advancement, and yet be saved from the hopelessness that such a situation might engender by indulging in dreams of future greatness. It is probable that a man could not live so happily (and, therefore, so effectively) under the unnatural and depressing conditions in which he often finds himself if he had not in phantasy the power of escaping from them and from their depressing influence.

It is clear that, in controlled thinking, there is a process of selection by which ideas relevant to the situation in hand are allowed a place in consciousness, while irrelevant ideas are shut out. It might be supposed that in day-dreaming, in which this conscious control is taken off, the succession of thoughts would be merely habit sequences. But observation shows that the thoughts of the reverie, no less than the thoughts of controlled thinking, are determined by an aim, although this aim is not one that is voluntarily pursued. The deprivations which we suffer

from environmental circumstances—the desires unsatisfied, the ambitions unfulfilled, and the intentions which have not been carried out—receive a phantasy satisfaction in the formation of day-dreams. In the terminology of Freud, day-dreams are wish-fulfilments.\*

Varendonck has shown in observations of his own day-dreams before sleeping, that, when the mind has a "wish" unsatisfied, the course of the day-dream will lead round to the fulfilment of that wish, whatever may have been its starting point, *i.e.* one cannot avoid a particular line of day-dreaming by deliberately starting with a thought which is irrelevant.<sup>367</sup> This means that the course of phantasy thinking is determined by its end, and not by the thoughts started from.

Day-dreaming probably goes on in the minds of all persons. When we are occupied in action, such day-dreams as we have are on the margin of consciousness and are not attended to. It is only when our concern with our environment relaxes that they become an important feature in our mental content. Adaption to reality is lost if phantasy assumes a more prominent position than this. The condition in which it does so is an extreme form of the state which Dr. Jung describes as *introversion*.† This occurs most completely in the condition of insanity known as *dementia praecox*.

Not all thinking of the phantasy kind, however, is mere dreaming without effect on behaviour. The word *ideal* has been used for a phantasy of ourselves as we would be, if this phantasy is such as to influence our conduct. It should be clear that the day-dream and the ideal are essentially alike in their psychological

\* Freud uses the word "wish" for any kind of impulse to behaviour whether consciously recognised or not. His theory of day-dreams is in its essence the same as his important and original theory of the nature of the dreams of sleep (with which I do not propose to deal). He supposes the difference between them to be that the dreams of sleep are concerned with wishes which have suffered a greater amount of repression and are therefore more disguised.

† See p. 111.

nature, but the difference between them is that the ideal is a phantasy product which takes sufficient account of the limitations of opportunity and environment to be able to act as a stimulus to action.

A medical student, for example, may have a phantasy of himself as a famous orator moving crowds by his eloquence, or he may have a phantasy of himself as a famous and successful surgeon. Both alike are phantasies, and both alike compensate for the incompleteness of his present situation by a phantasied success. But the orator phantasy can have no useful outcome in behaviour (so long as he is pursuing his present course) while the surgeon phantasy can act as a stimulus to his harder study. His orator phantasy may be called a *day-dream*, his surgeon phantasy an *ideal*.

It should be clear, however, that the day-dream and the ideal are not psychologically different. An ideal may be a compensation for present deficiencies, and it may be as extravagant from the point of view of our present situation as any day-dream. No sharp line can be drawn between the day-dream and the ideal, but if a phantasy is used as a stimulus to action it is called an *ideal*, if not it is called a *day-dream*.

#### 4. The Laws of Association and the Associationist-Hedonist Theory

Historically one of the most important attempts to found a psychology which would explain the whole of thought and conduct by the operation of a small number of simple mental laws was the principle of associationism, which attained its climax at the beginning of the nineteenth century in the work of James Mill.<sup>165</sup> It is necessary that we should distinguish between the "Laws of Association"—a set of principles which have been known since the time of Plato (although somewhat differently stated at different times), and "Associationism"—the general method of a psychology which made these laws the fundamental principle for the understanding of mental operations.

The laws of association which have been generally admitted are: first, the *law of association by contiguity*

(in time or place), that an idea B tends to follow an idea A, if A and B have been previously experienced together in time (either simultaneously or successively) or at the same place; and, secondly, the *law of association by similarity*, that an idea A tends to call up an idea B if B resembles A.\*

One of James Mill's examples of association by simultaneous contiguity in time is that having previously seen a violin and heard the tones of the violin synchronically, it now happens that when we think of the tones of the violin, its visible appearance occurs to us at the same time. Successive contiguity, he illustrates by the process of learning by heart. In learning a passage, we repeat the words successively from the beginning to the end. In repetition, the words also rise in succession, the preceding always suggesting the succeeding and no other.

The most important example we can find of association by similarity is the mental operation of classifying (*i.e.* of showing identical verbal or other reactions to similar things) which is essential to conceptual thinking. Thus when we have heard the word "monkey" applied to a particular four-handed, hairy animal, the sight of another similar animal calls up the idea of "monkey" by association through similarity.

The laws so far described can be used only to explain the processes of thought. The associationists believed that with the addition of certain laws of the determination of the strength of different bonds of association by

\* There was dispute about the exact number of associative laws. Some writers included a principle of "association by opposition" as when the idea of black calls up the idea of white. Hume added "association by cause and effect."<sup>107</sup> James Mill rejected the law of association by resemblance and admitted only the law of contiguity. Associations attributed to opposition and to cause and effect are probably only special cases of the effect of contiguity. Resemblance, on the other hand, seems to be a true cause of associations. It is difficult to see how similar but not identical things could be recognised as belonging to classes without the operation of some such principle.



frequency of repetition, by recency, etc., a complete account of the psychology of thought could be given. A further principle was necessary in order to explain behaviour. This was provided by the conception that pleasure and pain were the two determinants of behaviour and that we learned to follow lines of behaviour to which the idea of pleasure had become associated and to avoid others which had become associated with the idea of pain. This theory is commonly called the theory of *psychological hedonism*,\* and the combination of these two theories may be called the *associationist-hedonist* theory.

An example of the use of this combined theory in the explanation of human behaviour is to be found in James Mill's account of the origin of parental love.

"First of all, there can be no doubt, that all that power of exciting trains of ideas of our own pains and pleasures, which belongs to the pains and pleasures of any of our fellow-creatures, is possessed by the pains and pleasures of a man's child.

"In the next place, it is well known that the pains and pleasures of another person affect us, that is, associate with themselves the ideas of our own pains and pleasures, with more or less intensity, according to the attention which we bestow upon his pains or pleasures. A parent is commonly either led or impelled to bestow an unusual degree of attention upon the pains and pleasures of his child; and hence a habit is contracted of sympathizing with him, as it is commonly, and not insignificantly named; in other words, a facility of associating the ideas of his own pains and pleasures, with those of the child."

Similarly a child's avoidance of a hot poker may be attributed to the pain following an earlier act of touching it having caused the idea of touching it to be associated with the idea of pain.

\* To distinguish it from the theory of *ethical hedonism* that the increasing of pleasure and decreasing of pain ought to determine our conduct.

It is obvious that the ideas of pleasure and of pain may be superfluous in these explanations. A child might avoid a hot poker after once burning himself because a reflex avoidance was called up directly without the intervention of any thought about pain. Introspection seems to show that while thoughts of pain and pleasure may occur in reflective thinking about objects we have learned to avoid or to seek, they are not essential to these reactions. We avoid what has proved harmful to us and seek what has proved beneficial without any thought of pain or pleasure. We might then modify the associationist-hedonist account of the matter by substituting "avoiding and seeking reactions" for "ideas of pain and pleasure." We should then have a picture of the motivation of conduct which would be essentially that of the reflexologists or the extreme behaviourists. It might still not be a true one. It remains possible that the impulsion to certain lines of conduct is not acquired but inborn or, if it is acquired, that it is acquired in some other way.

We have already discussed in connection with the conditioned reflex theory the reasons for supposing that the above picture of how new behaviour patterns are acquired is far too simple to fit the facts.\* There is also good reason for supposing that some behaviour drives are, in part at any rate, determined by an inborn tendency and are not wholly learned. This is probably true of the parental drive. The persistence of a mother's love in face of difficulties and dangers, and even when her child is causing her pain and arousing ideas of pain is not accounted for on the hedonist theory.

The approach of associationism to the problems of the mind was "atomistic"; it sought to understand the processes of thought by analysing them into simple elements. In this respect it reflected the scientific attitude of its time. James Mill was a contemporary of Dalton and published his *Analysis of the Mind* twenty years after Dalton had

\* pp. 66 ff.

brought forward his atomic theory of matter. Dalton's theory made a notable advance in the understanding of chemistry, and it was natural to hope that a similar advance might be made in other sciences by the same method of approach. J. S. Mill called the associationist-hedonist system of theories "mental chemistry."

It is obvious, however, that a principle which has been a successful guide in one branch of knowledge may not be equally successful in another. We have already considered some of the reasons for rejecting an atomic account of the structure of mental processes. Neither introspection nor experiment seems to give any support to the view that thought processes are made up of discrete elements (the ideas) bound together by bonds of association. It is true that, under certain conditions, discrete elements of thought such as images or words may be observed, but the principle of association of ideas claimed to explain the whole of thought, not only a part of it.

The associationist psychology differed from the chemistry of its time in one vital particular. The theories of associationism were not based on experiment. Whereas experiment amply justified the atomism of Dalton, it was found when psychologists began to experiment that the expectations of the associationist-hedonist atomism were not fulfilled. So experimental psychologists were led either to complicate the simple associationist theory by adding subsidiary hypotheses which destroyed its one advantage of simplicity, or else to reject altogether the view that thought processes could be understood by postulating simple elements as their constituents.

We have already discussed the "determining tendencies" or "mental sets" revealed by experiments on the higher thought processes. Indeed it should have been clear without experiment that mere associationism could only explain the reproductive or mechanical side of thought. Controlled thinking is directed and dominated by the necessity for solving the problem which called it

out. We solve our problems, not by forming successions of ideas each of which is determined by the strength of its associative bonds with the last, but by counteracting any tendency of our minds to such mechanical association by selecting our ideas in accordance with their relevance to the purpose in hand. In Spearman's terms, such thought is "eductive," whereas the associative tendency is merely a "reproductive" one.<sup>224</sup> The emergence of reproductive processes when eductive processes are required is a common source of error.

Even in the explanation of purely reproductive processes, the simple associative principle is not adequate. There is an obvious difficulty in explaining the learning of poetry by heart as the result of associations formed between each word and the next. Let us suppose that the passage is: "The curfew tolls the knell of parting day." The associationist principle explains that we say "curfew" as the second word because, in learning, it became associated through successive contiguity in time with "The." But the next time "the" comes, it calls up not "curfew" but "knell." With which of these words did "the" become associated in learning? The difficulty is insoluble if we think of serial learning as the forming of associative bonds between successive words. We must regard as the determining cause of the saying of "knell" not the preceding word "the" but the whole of the preceding passage. This was stated by Bradley as the *Law of Redintegration*: "Any part of a single state of mind tends, if reproduced, to reinstate the remainder." But here we are giving an explanation in terms of a whole state of mind, not of the elements into which it can be analysed. If this principle be admitted, as it certainly must be, the distinctive character of associationism is destroyed, for even mechanical learning cannot be explained by associations formed between successive ideas.

Associationism has been the starting point of many fruitful experimental enquiries. In that way it has been

serviceable to psychology. In itself it was sterile, and the long preoccupation of psychological thought with this "mental chemistry" probably did a great deal to retard the development of a true science of mind. If the test of a scientific psychology is its power to enable us to understand and predict human thought and behaviour, the associationist-hedonist theory failed lamentably in this test. Probably the untutored person who relied on his own intuitions about other people came far nearer to understanding them than he could have been brought by any study of the theories of associationism. The associationist-hedonist school of thought was indeed not a science for the understanding of a world of human minds but of one populated by simplified robots.

## CHAPTER XV

### CONFLICT AND VOLITION

#### 1. Conflict Between Impulses

If the environment were so simple in its demands on the organism that at any one moment only one behaviour tendency was called into action, behaviour would be simple and predictable. This, however, is very often not the case, and the different elements in a complex situation will set into operation the tendencies of different behaviour patterns whose separate activities would be incompatible with one another. This is the condition known as *conflict*.

Simple conflicts between the behaviour of different instinctive tendencies may be observed amongst animals. Inquisitive animals, such as cows or deer, will often come as near as they dare to an intruder in their fields, looking intently at him, but with bodies alert for flight if he should make an unexpected movement—their behaviour being obviously a compromise between the incompatible behaviour dictated by their curiosity and by their fear. A conflict between the behaviour impulses of submission and of flight may be seen in the case of the imperfectly trained dog who hears his owner's whistle but is afraid of being punished or fastened to the lead. He comes close, and one can see the alternative or simultaneous movements of his limbs calculated to take him towards or away from his owner, neither of these impulses being able sufficiently to take control of his motor apparatus to make him take either course of action to the exclusion of the other, so that he remains at a short distance from his owner with conflict portrayed by every muscle of his body.

## 2. Conflict on the Physiological Level

The competition of mutually incompatible impulses on the physiological level was studied by Sherrington, using "antagonistic" reflexes in a spinal dog.<sup>214</sup> The "scratch reflex" can be elicited by stimulating any part of a saddle-shaped area on the dog's back. If this is done on the left side of the dog's body, scratching movements are made with the left foot. A stimulation of the right foot which would normally produce an extension of the left foot, will cut short the rhythmical flexions of the scratch reflex. There is interference between the two reflexes, for this extensor reflex requires steady excitation of the extensor neurones of the left leg and steady inhibition of the flexor neurones, while the scratch reflex requires rhythmical excitation of the extensor neurones. This interference produces inhibition of the scratch reflex. The extensor reflex could be similarly inhibited by the scratch reflex.

What does not happen is a simultaneous appearance of both reflexes resulting in a movement which is a compromise between the two. Such a compromise would clearly not be adaptive, for the movement would attain the end of neither reflex. If the dog were threatened with injury to the right foot while he was scratching a flea with his left, he would either put his left foot down to bear the weight of his body while he withdrew his right foot (the purpose of the extensor reflex following a stimulation of the other foot), or he could go on scratching his flea by keeping his right foot still. A compromise would be useless, for an incomplete extension of the left foot accompanied by an incomplete scratch would neither injure his flea nor save him from falling over.

## 3. The Resolution of Conflicts

We may distinguish three main ways of dealing with conflicts (with indefinite gradations between them). (1)

Two incompatible impulses may both occupy the mind together leading to action which is rendered ineffective by their mutual interference. (2) The action to which two impulses lead may be a compromise between the behaviour dictated by each, *i.e.* it may be behaviour which attains the end of each impulse, although probably less effectively than if either impulse were acting alone. (3) One impulse may be translated into action while the other is not (the impulse sacrificed is said to be *inhibited* or *suppressed*).

#### 4. Conflict in Thought

On the level of action two incompatible behaviour systems cannot usefully find expression simultaneously. The illustration we have already given, of the dog torn by the conflict between the impulse to obey his master's whistle and to run away, is an example of two incompatible behaviour-systems taking possession of the muscles at the same time. But this is a condition of ineffective action; it attains the end of neither system. This is more common when the two impulses both exist in thought alone. We then have a condition known as *doubt*.\*

A condition of doubt tends to pass into a condition of *belief* (in which one of the competing opinions is adhered to while the other is rejected) for two reasons. First, the condition of doubt is itself an unpleasant one, and the mind tends to pass spontaneously into a condition of belief in order to relieve itself from the unpleasure of doubt. Secondly, the demands of action necessitate the following out of the behaviour belonging to one opinion or the other. The doubt about whether one is a Liberal or a Conservative may persist as long as these two opinions are merely intellectual, but when an election comes, one must

\* Doubt, of course, may be between two purely intellectual opinions which have no outcome in action. This, however, is rare. Most of our opinions have implications in behaviour. It is only such opinions as have behaviour implications that we are now discussing (*e.g.* political or religious opinions).



vote on one side or the other. To allow both opinions to find equal expression in one's voting would be to abandon effective action altogether.\*

When, for either of these reasons, the mind passes from doubt to belief, it is usual for the intellectual case for the rejected opinion to pass from the mind altogether. One compensates by a feeling of subjective certainty about the opinions one embraces for the objective uncertainty of their truth. Subjective certainty or the refusal to see both sides of a case is the response of our minds to the demands of action. Its compensatory function is shown by the fact that when cherished beliefs begin to be undermined, our immediate response is often an increased strength of our apparent certainty of them. Immediately before a conversion the convert is often most bitterly antagonistic to the cause he is about to embrace.

The peculiarity of conflict in thought is a possibility of the continued retention in thought of both of two opinions leading to incompatible behaviour. As soon as these opinions must be translated into action, one or other of them must be sacrificed unless we are content for our action to be ineffective. It is for this reason that men of thought tend to be ineffective in action, and that men of action tend to be intolerant in thought.

## 5. Sustained and Incidental Conflicts

The word *conflict* is used in two senses in psychology, and these two senses are not always kept distinct. One speaks of a *conflict* when a person has a mental disposition whose behaviour is incompatible with some other mental disposition. For example, a soldier in battle possesses the self-preservative system of tendencies on the one side and on the other his loyalty to his regiment, tending the one to make him run away, the other to make him fight. We

\* The deliberate acceptance as a guide to action of an objectively uncertain body of opinions is the attitude of *faith*.

also speak of *conflict* when at any instant two incompatible impulses are both activated, as, for example, when the same soldier is suddenly made to feel the impulse of escape by the bursting of a shell close to him while he is going somewhere on duty.

These are clearly quite distinct—a condition of conflict and an incident of conflict. The condition of conflict is a permanent incompatibility between two dispositions, which is leading to continual recurrences of temporary conflicts of the second order. I shall distinguish these as *sustained* and *incidental conflicts*. *Sustained conflicts* are like wars of the mind, in which the incidental conflicts are the individual battles.

Sustained conflicts are generally meant by the word *conflict* in psycho-analytic writings. A certain number of sustained conflicts exist, of course, in all human life. They become serious when the conflict is of such a nature that, in order to escape the pain of continual incidental conflicts, the mind makes some new adjustment towards the major dispositions from which the sustained conflict arises. Such a new adjustment may be the suppression of one of these dispositions with its subsequent deflection or repression. If the deflection is a socially desirable one, such a new adjustment of the mind is a satisfactory way of dealing with the conflict.

The psycho-neuroses arise, according to the theory of Freud, by a new adjustment of mind which is unsatisfactory (*i.e.* which results in conduct which is ineffective in dealing with environment problems).<sup>83</sup> Freud considers that the fundamental sustained conflict from which the psycho-neurotic conditions arise is the conflict between the impulses of what he calls "sex" and "Ego." Freud considered that, for example, a hysterical symptom is a compromise formation, *i.e.* a mode of behaviour which satisfies to some extent both the demands of the sex instinct and of the mental forces repressing the sex instinct,

in which the behaviour dictated by both is represented but in which the adaptation is unsatisfactory.

The symptoms known as shell-shock in warfare were found to be of a hysterical nature, and were considered by Rivers to be an unconscious adaptation to the incompatible demands of the gregarious and self-preservation systems of tendencies. This adaptation was made by the development of a symptom which unfitted the soldier for action, and so saved him from danger, but in a way which did not involve carrying out explicit behaviour of an unsocial kind (as running away).

Rivers wrote: "Among the most frequent results of shock and strain in war are paralyses, often accompanied by contractures and anaesthesias. The paralysis may attack almost any part of the body, but paralysis of speech is especially frequent, while the anaesthesias may affect not only the skin, but also the special senses of sight and hearing, and less frequently of taste and smell. All these occurrences have the common feature that they unfit their subject for further participation in warfare, and thus form a solution of the conflict between the instinctive tendencies connected with danger and the various controlling factors which may be subsumed under the general heading of duty."<sup>202</sup>

These are examples of sustained conflicts of such severity that they have produced a new adaptation towards the environment which is regarded as a mental disease because it is an adaptation of an ineffective kind. There are, however, incompatible systems of dispositions in all of us producing sustained conflicts. The moral conflict, for example, is the sustained conflict between certain elements of our self-preserved and sexual tendencies on the one hand, and a group of tendencies to socially desirable conduct on the other. Individual moral decisions are battles in this sustained conflict.

It is improbable that the difference between the psycho-neurotic of peace-time and the normal person is that the circumstances of the psycho-neurotic produce more violent conflicts than those of the normal person. It seems more likely that he has innate tendencies to make adaptations of an ineffective kind. If he is cured

of a psycho-neurosis by removing one conflict he is likely to form another round the nucleus of another conflict.

The normal person modifies the severity of his sustained conflicts partly by bringing them under systems of adaptation to the world as a whole. Such systems are, for example, his religion, his moral principles, or any other attitude towards the world as a whole which serves the same function as religion. The particular mode of adaptation known as the religious one will be discussed in a later chapter.

## 6. Impulsive and Volitional Action

It appears to common observation that there are two ways in which we may deal with the impulse to behaviour which results from the activation of some tendency. If the impulse is allowed freely to discharge itself in behaviour, the resulting action is *impulsive*. If, on the other hand, we decide to check the impulse and so prevent its behaviour from being carried out, this inhibition is *volitional*.

Similarly, if the situation is one which arouses a conflict between impulses, and this conflict is allowed to resolve itself without interference from the self or Ego, so that the strongest impulse results in action (or some compromise behaviour is adopted) we have again impulsive action. If, however, we decide to follow some other line of conduct than that which is dictated by the strongest impulse of the competing system (*i.e.* if the strongest impulse is voluntarily inhibited and some other impulse is voluntarily reinforced), the resulting action is volitional action.

We are not, for the moment, concerned with whether these two kinds of behaviour are really distinct but only with the distinction that appears to exist between them to common observation, which also is made between them in ordinary speech. Many (probably most) currently accepted explanations of volitional action refuse to accept

this distinction as real and are in effect, methods of explaining volitional action as a kind of impulsive action. I believe that these attempts are mistaken for reasons that will be discussed later.

At present we need only decide that there is an apparent difference. A man may take his dog for a walk on a fine evening because a walk is a more immediately attractive course of action than remaining indoors. On a wet, cold evening, on the other hand, the fireside may be much more attractive. He may obey the impulse to stay by the fire, or he may force himself to go out. If these two kinds of behaviour are really of the same kind, they certainly do not appear so to the person carrying them out. He expresses the difference (if he is a psychologist) by saying that the second is a "volitional action"; otherwise he may say that he has carried out an act of "will" or (more objectionably) an "act of the will."

The formulation of volitional action as an act of "the will" may reasonably be objected to because it seems to imply that volition is a result of the activity of a special part of the mind—the faculty of will. This may not have been what was meant in the past by those who spoke of the faculty of will, but it is a dangerous implication of "the will," so this term is better avoided. If we admit volitional activity to the status of a special kind of activity, we must regard it as an activity of the Ego or self as a whole and not of some special part of the Ego.

Volitional effort may be directed towards the inhibiting of an impulse which is the result of an external situation or of one which is the product of the individual's native or acquired dispositions. Let us suppose, for example, that a man is lying in bed at night during a war when he hears the syrens which announce that an air-raid is expected. If he is a timid man, his strongest impulse may be to jump out of bed and go down to the cellar. If he does so, his action is an impulsive one. For various possible reasons (good or bad), however, he may decide

to resist this impulse. He may have an ideal of himself as calm and indifferent in danger. So by volitional effort he inhibits the impulse to go down, and, instead, stays in bed. If the impulse is very strong or if his capacity for volitional effort is small (*i.e.* if he is "weak-willed"), he may find himself unable to carry out his decision and may go to the cellar in spite of it.

His neighbour on the other hand, may differ so much in temperament that he is acted upon by a different set of impulses. Instead of being timid, he may be lazy, comfort loving, or mentally inert. His previous experience of air-raids in which no harm has come to him may have weakened the fear response so that his strongest impulse is to stay in bed. If he gets up and goes to the cellar, more or less effort of volition will be necessary to overcome the tendency to stay where he is.

There is not, of course, any reason for regarding a volitional action as necessarily better than an impulsive one. A mother whose young child falls into the river may find that her strongest impulse is to jump in after it. If she does so that will be an impulsive action. Normally that will be a better thing to do than to make the volitional effort necessary to stay on the bank.

Right action is not always (or, I think, even generally) action taken against the direction of impulse. Sometimes, however, it is. The power of carrying out volitional actions is, therefore, a necessary power in the service of right conduct. It can, however, equally well be used in the service of bad conduct. As much volitional effort may be expended by a murderer in overcoming his impulsive sympathy for his victim or by a burglar in entering a house, as is used by a soldier in overcoming his impulse to run away or by a fireman in facing a fire. The overvaluation of voluntary effort for its own sake is not uncommon, and leads to a type of character formation in which a large number of the more obvious impulses are inhibited (particularly those of tenderness and fear).

## 7. Strength of Will as a Character Trait

It is a common opinion that strength of will or capacity for volitional effort is a character trait of some importance

which differs in amount from one individual to another. It is also commonly supposed that it is a trait which can be strengthened by use and weakened by disuse. Both of these opinions lack scientific confirmation but seem, from common observation, to be very probably true. No one has yet devised a satisfactory method of testing strength of will. This is probably not because there is no such quantity to be measured but because it is very difficult to devise a test situation in which a performance will depend on the strength of the subject's capacity for volitional effort and on no other factor (or only on other factors to an extent that can be measured and allowed for).

The common observation on which this opinion of the importance of individual differences in strength of will is based is that one man seems to be swayed by external things and by his own impulses while another seems to have the power of opposing and controlling them. The first man abandons effort when he meets with an obstacle and becomes violent when he is angry; the second man also meets external obstacles and impulses to violence, but he continues his efforts in spite of the obstacle and can check his impulse to violence when he is angry. The latter is spoken of as a man of strong will. He may, of course, decide on a particular occasion to allow his anger to express itself in violence. When we say that he has strength of will, we mean that he seems to be able to decide whether his anger shall be expressed in one way or another. Our total impression of his character is of control, of a certain capacity to decide whether to oppose or to give way to the forces both from outside and from inside which tend to give direction to his behaviour. The weak-willed man, on the other hand, seems to be much more at the mercy of these forces.

We have already pointed out that volitional effort may be used to overcome both external and internal forces, not only the impulses set into action by things outside but

also those that originate from the man's own dispositions and temperament. The man of strong perseverative tendencies (or great mental inertia) may be conspicuously successful in overcoming all external obstacles. He may feel that he is the destined saviour of his nation, or, that he has discovered how to square the circle, and external difficulties, the opposition of other people, and the evidence of facts discordant with his views are all alike powerless to turn him from his path. His steadiness in pursuing his aim may convince a certain number of other people, and if he is lucky may even land him in a position of authority which at first seemed unattainable.

We may well be awed by such a character but there is no reason for regarding him as of strong will. It is the function of volition to control internal forces as well as to master external obstacles. The evidence which points to strength of will is not only that a man can overcome external objects when he has chosen to go on, but also that he can inhibit his own perseverative tendencies when he has chosen to stop. The individual who shows abnormally great perseverative tendencies may well be one who has insufficient volitional control over them.

The range of behaviour over which volitional control can be exerted probably depends on training, although there is little exact knowledge on this topic. Normal persons can control some simple reflexes (withdrawing the hand when pricked, and the regular action of the lungs), but not others (the contraction and dilation of the pupils, and the beating of the heart). Most of us can control the impulse to physical violence when we are angry, unless the impulse attains very unusual strength. The child has very much less control of his impulses, and the process of growing up is accompanied by a progressively greater capacity for voluntary control.

Many systems of "mental culture" have as their aim the bringing of responses more completely under volitional control. It seems very likely that mental exercises can be used successfully for this purpose. Habitual control of impulses may make this control easier. Such habitual control is at the base of all forms



of asceticism. The ascetic practises control in indifferent matters so that it may be easy for him to control his responses in important situations

We do not know what are the limits of this increased possibility of control. Some Yogis are asserted to be able to stop the beating of their hearts at will, and even to die. These are extensions of the ability which we all possess, almost completely to stop our breathing for a time, and to stop the activity of our voluntary muscles. They are not, therefore, *a priori* impossible. If we followed the methods of the Yogis we should presumably be able to extend very much the power of voluntary control over bodily and mental processes now automatic. There does not seem to be, however, any reason for supposing that such increased control is, for most of us, in any way desirable.

Voluntary control is of importance only so far as it is of value in our adaptation to our environment. It is important for our adaptation (to our social environment) that we should be able to control the crude primitive conduct of anger. It is of no adaptive value that we should be able to control the beatings of our heart. The tendency of evolution has been to make automatic those bodily and mental adjustments which cannot usefully be controlled and to extend the control of thought to those that can. There is no doubt that, in his complex environment, the extent to which man can voluntarily control certain of his responses is of the very highest value. It is, of course, arguable that we should be the better for increased power of voluntary control in many directions, although there seems to be no ground for thinking that the complete replacement of automatic functioning by conscious control would be a reasonable aim even if it were an attainable one.

## 8. Explanations of Volitional Action

The difficulty that has been felt in explaining volitional action lies in the fact that of two impulses, it is often the one which appears the weaker that is voluntarily adopted. This difficulty appears greatest in the theory of psychological hedonism. If we accept the theory that that action is always adopted which is more pleasurable to the person performing it, there is a real difficulty in explaining how, on a cold evening, we can abandon the

highly pleasurable passivity by the fire-side for the extremely unpleasurable discomfort of going out.

It is clear to introspection that of two courses we are adopting the one which has less pleasure attached to it. We may say, in the interests of the theory of hedonism, that the unpleasure attached to the self-reproach which we should feel if we stayed indoors outweighs the pleasure derived from our bodily comfort, and that the course of going out is really the more pleasurable one although it does not appear so to introspection. Now it is possible to explain all volitional action on these lines, and the explanation is difficult to refute, but it is clear that if we accept this sort of explanation, the pleasure-pain theory of conduct ceases to have any value for predicting behaviour. For we have merely said that the action which has been carried out is the more pleasurable because it is the one which has been carried out. As an explanatory principle it reduces itself to the form of a mere tautology—the one of two competing motives which will be chosen is the one which is chosen.

Many similar statements about volitional action are similarly tautological. We may take as an example Titchener's statement: "*it is always the strongest impulse that wins*; though . . . it is not necessarily the impulse that looks the strongest to psychological observation."<sup>252</sup> It is necessary to be clear about the fact that this impressive statement means very little. Suppose that we were to say that when two weights are suspended over a pulley, the heavier will fall while the lighter will rise. This is a meaningful proposition only because we have a method of distinguishing which is lighter and which heavier, apart from the observation of their behaviour on the pulley (the heavier will, for example, weigh more if placed on a spring balance, and it will attain less velocity than the other when both are acted on by the same force). But it is clear that if we had no way of knowing which was heavier except by observing which went downwards when they were suspended over a pulley, there would be no meaning in the statement that the heavier went down. We might, indeed, use this property as a definition of the sense in which we were going to use the word "*heavy*," but the statement would

give us no new information about the weights. Now it is clear that we have no independent way of saying which is the stronger impulse. It is not the impulse with the greater amount of pleasure attached to it, and it is not the one which appears stronger to introspective observation. So the statement that the strongest impulse always wins merely reduces to the form that the impulse that wins always wins, which is clearly not a very illuminating proposition for the understanding of the psychology of volition.

We may turn to a different treatment of volition, that of William James.<sup>113</sup> A propensity, he says, may be stronger than the ideal impulse which opposes it. In a volitional action something is added to the weaker ideal impulse which makes it outweigh the propensity.\* He puts this in algebraic form. Let  $P$  equal the propensity,  $I$  the ideal impulse, and  $E$  the effort (what is added to the ideal impulse by the act of volition).

$$\begin{aligned} &\text{Then } P > I \\ &\text{but } I + E > P \end{aligned}$$

This formulation represents, James says, how the mechanism of volition appears at first sight. He does not seem to have regarded this algebra very seriously. The effort which is added on the side of the ideal impulse is, he considers, an act of attention to a difficult object, and the holding of it fast before the mind. We overcome the resistance to getting up in the morning by a voluntary

\* William James speaks as if volitional effort were necessarily on the side of an ideal impulse opposed to a propensity. The reason appears to be that he follows the Puritan tradition of identifying moral action with volitional action. Thus he says: "ideal or moral action . . . is action in the line of the greatest resistance." We have already argued that action in the line of the greatest resistance may not be moral action. Most of us would find that greater volitional effort was necessary to commit a burglary than to give five shillings to a charity. Nor does there seem good reason for James's implied identification of ideal action with moral action. Moral action may be dictated by a propensity and immoral action by a system of ideas (as, for example, by the anti-semitic system of ideas). Also volitional effort may be exerted on the side of a propensity and to inhibit conduct proceeding from a system of ideas.

holding before our minds of the idea of getting up, and it is, he says, a mere physiological incident that when it is thus attended to, the immediate motor consequence of getting up should ensue.

The general principle that movement is the automatic result of thinking of the movement to be carried out is called the principle of *ideo-motor action*. James's explanation of willed behaviour may be called the *ideo-motor theory of volition*.

It will be noticed that it does not get over the difficulty of how volition can apparently drive behaviour along the line of greatest resistance. It simply shifts this difficulty to a different point. On this theory we make volitional decisions by altering the train of thought. How then do we alter the train of thought? If staying in bed is more immediately attractive than getting up, is not the thought of staying in bed more attractive than the thought of getting up? The ideo-motor method of carrying out willed behaviour can only work if voluntary effort is capable of overcoming the impulse to dwell on the more attractive or pleasant of two lines of thought. The theory does not get rid of the necessity for regarding volition as an effective force.

James seems indeed to recognise this since he speaks of a "fiat" or "volitional mandate" as if this were really an effective agent in volitional action although only directly effective in controlling the train of ideas and indirectly through these controlling behaviour itself. All that happens after the train of ideas has been volitionally altered is typically impulsive action in which one set of impulses has been artificially strengthened by paying concentrated attention to it.

McDougall, in his *Social Psychology*, accepts James's general statement of the problem, but considers that the *E* which makes the ideal impulse outweigh the propensity is an impulse aroused within the system of the

self-regarding sentiment\* (such as the thought of the injury that would be done to our idea of ourselves if we were overcome by the discreditable impulse to remain indolently in bed).<sup>153</sup>

Dickenson describes the way in which he decides whether to go home to lunch or to go to a restaurant: "I mentally explore the consequences or implications of my going home. I recall the apple pie in the pantry, where-upon my strong apple pie seeking response joins its energy to the others which are trying to take me home."<sup>154</sup>

Such explanations as those of McDougall and Dickenson owe their attractiveness to their apparent success in explaining volitional action as merely a kind of impulsive action in which the apparently weaker motive has had some added strength through being allied to some other system of motivation and thus attains its success in influencing conduct through its impulsive strength and not through any influence of a volitional force.

This success is only apparent since on either explanation one is left with an unexplained step unless one assumes the effectiveness of volitional effort. McDougall's expression "throwing an impulse into the scales" certainly implies that volitional effort has changed the sequence of thought. Dickenson avoids this implication by saying that "the impulse joins its energy to the others." His own

\* The completeness with which McDougall in this book identifies volition with the activity of the self-regarding sentiment is shown by the fact that he defines volition as "the supporting or re-inforcing of a desire or conation by the co-operation of an impulse excited within the system of the self-regarding sentiment." It is true that in a later book,<sup>155</sup> he puts forward the more adequate view that "will is character in action," i.e., that in volitional action we bring the whole organisation of tendencies which we call "character" to bear on the situation which demands action. This formulation still seems to be open to the objection that it blurs the distinction between impulsive and volitional action. The volitional act is still regarded as the automatic outcome of the conflict of impulses but of impulses that have come from the whole organised system of dispositions and not only from one part of it.

active control of the mental processes seems, however, to be implied by the phrase "I mentally explore." If this is not meant, and he really decides what to do altogether passively by allowing his ideas to develop undisturbed and the resulting impulses to decide by their intrinsic strength which shall result in conduct, then truly there is no effective volitional effort. That the author makes all his decisions in this way seems incredible; it would seem to be more likely that his introspection is at fault.

Instead of trying to explain away volition as an illusion of self-directed decision in a field of behaviour really determined by the play of impulsive forces, we may consider that the Ego or self can itself create forces which alter the stresses in a way which sometimes (but not always) determines the action to be carried out. This certainly is how the case appears to be at first sight. If this is accepted, it removes us still further from McDougall's view that the only sources of energy are the innate propensities.\* We have already argued that acquired behaviour tendencies (such as the attitudes and the habit systems) must also be regarded as sources of energy. We must now add that the volitional activity of the Ego is an additional source of energy.

The reasons which have caused many psychologists to regard this view as obviously untenable seem to be a relic of the mechanistic thinking which resulted from men's habits of thought having been, from the time of Descartes, dominated by the problems of the physical sciences. I do not think that they were ever sufficient reasons, and they seem now to have largely lost whatever cogency they once appeared to have.

There seems to be no good reason for denying the reality of the effect of volitional effort on behaviour, and the various attempts to explain away the reality of this effect seem to be incomplete in themselves and to lead to a most

\* p. 123.

undesirable neglect by experimental psychologists of an important aspect of human behaviour. We shall, therefore, accept the hypothesis that volition is an effective influence of the Ego on behaviour as the most likely to be true, while admitting that much more may be known about the subject in the future when it has been more adequately explored experimentally.

It is obvious that not all human behaviour is volitional and that the forces contributed by volition are often weak compared with those of well-established attitudes, particularly those based on innate tendencies. Strong efforts of will have enabled men to refuse food when hungry, to deny themselves love and the companionship of others. More commonly the attractive forces of these things are stronger than any volitional effort made to resist them. Volition exerts a kind of rudder action on behaviour, using small forces, not to control the major forces from the emotional systems, but allowing these so much free play as is consistent with the maintenance of a chosen general line of behaviour.

The necessity for continual pressure of volitional effort on behaviour is lessened by the tendency of lines of conduct to form habit systems. Having got out of bed at a certain time every morning, we have formed a habit of getting up at that time, so the minimum of volitional effort is now required for getting up. In the same way, our voluntary decisions about ways of reacting form the basis for attitudes, so that it is only in unusual circumstances that strong volitional effort is required.

The frequent relative weakness of volitional forces and the arduousness of the effort which is necessary in order to create strong volitional forces suggest an explanation of the various kinds of volitional decision described by different writers. We have seen that William James made volitional decisions by paying concentrated attention to the line of conduct that had to be carried out; Dickenson makes his decision by throwing his apple-pie seeking

response on to the side of the impulse that finally wins; McDougall by throwing on the side of the favoured impulse motives derived from his self-regarding sentiment.

I do not think that any of these are descriptions of the essential character of volition but are merely accounts of individual devices for facilitating the carrying out of a volitional decision. There are probably others. At one time, for example, I found myself unwilling to carry out a decision because it would have disagreeable consequences. I found that by paying concentrated attention to these consequences they seemed to become less unendurable and I made my decision with ease. The Stoic Emperor Marcus Aurelius Antoninus wrote : " When you find an unwillingness to rise early in the morning, make this short speech to yourself : I am getting up now to do the business of a man; and am I out of humour for going about what I was made for, and for the sake of which I was sent into the world? Was I then designed for nothing but to doze and to keep warm beneath the counterpane? . . . Is not action the end of our being?"<sup>42</sup>

It may reasonably be suggested that these are all merely methods of economising volitional effort. A direct volitional effort to overcome an impulse involves an unpleasant effort. Also it may not have the desired effect since the force of volition may be too weak. Such methods as fixing the mind attentively on the action to be carried out (James), thinking of the purpose of existence (Antoninus), or thinking of the apple-pie in the pantry (Dickenson), are all ways of making volitional effort less arduous and its success more certain. Dickenson could presumably have gone home by merely deciding to go home, even if there had been nothing but cold rice pudding in the pantry, but both the unpleasantness of indecision and of volitional effort were avoided by the thought of the apple-pie.

The general aim of economising effort leads us all to make our volitional efforts easier in some such way, unless indeed our aim is to maximise volitional effort for the sake



of strengthening our general capacity for making such efforts (*i.e.* of increasing our strength of will). Then we may say to ourselves: "It is cold and wet, I shall be thoroughly miserable if I go out, while I should be happy by the fire. I am going out all the same." That is volitional effort without any devices of thought to make it easier. For ordinary life, it is unnecessarily strenuous.

It should be noted that we are not here discussing the problem of free-will but the preliminary problem of whether there is any special class of "willed actions." If all action is impulsive, it is obvious that the question of whether volitional action is or is not "free" does not arise.

The problem of free-will is probably partly a factual one but is much more a verbal one depending on the use of the word "free." When the nature of volitional action has been sufficiently clarified by the devising of an adequate experimental technique for dealing with volition and by clear thinking about the results of such experiments, it is to be expected that the factual element in the problem of free-will will be found to be solved. The verbal part of the problem may be safely left to those who are specially concerned with such questions.

## 9. Principles and Ideals

The mere random exercise of the capacity for volitional action would be of no service in adapting the individual to his environment. Its value lies in the fact that consistency in volitional decisions can give some other general direction to behaviour than that which would be imposed by the innate or acquired behaviour tendencies. Thus the habitual volitional effort of men to overcome their impulses to physical aggression makes possible a closer social co-ordination than would be possible if these impulses were unchecked or even if they were checked only by the impulses derived from social attitudes.

To secure the required consistency of volitional actions, it is necessary that these should be guided by general principles of conduct or by Ego-ideals. By general principles of conduct are meant verbalised formulations of

general directions of behaviour, such as the principle of not causing unnecessary unhappiness to other people, and of being honest or truthful. By an Ego-ideal is meant a phantasy of oneself as one would like to be.\* Thus a man may check his impulse to run away in danger either because he has formulated to himself the general principle that he will not run away, or because he pictures himself as a hero (or identifies himself with a particular hero).

These two methods of giving consistency to volitional activity correspond to two different methods in the education of behaviour. If we wish children to be brave (to learn volitional control of their timidity), we may teach them the general principle of not running away when they are afraid, or we may read them accounts of explorers and soldiers who have been conspicuous for their courage, and, by expressing our approval of these, we may hope to lead the children to adopt them as Ego-ideals.

Both principles and Ego-ideals are, of course, very largely provided for each individual by his social environment. The moral maxims current in his social group provide him with the material for his general principles, and the marks of social esteem given to distinguished individuals help him to find his Ego-ideals. The socially provided principles of conduct may be different from the

\* Neither "general principle" nor "Ego-ideal" is here used with any moral implications. A man may have a "general principle" of being offensive to those he regards as his inferiors, and he may have an Ego-ideal of "a man of the World" or some film star. Like volitional action itself, the general principles which guide it may be good, bad, or morally indifferent. Probably trivial Ego-ideals are amongst the commonest sources of worthless general patterns of behaviour: "The pitiable models on which people form themselves! Once it was the Imitation of Christ—now of Hollywood." (*Eyeless in Gaza*, Aldous Huxley). It is often said that so-and-so is a "man of principle" or a "man with ideals" as if this were equivalent to saying that he is a good man. The mere possession of effective principles and ideals only guarantees consistency of conduct. If we wish to know whether such a man's conduct is good or socially valuable, we must also know what principles and ideals he has chosen to follow.

socially provided Ego-ideals and then the Ego-ideals seem to prevail. Thus the individual who lives in a Christian acquisitive-competitive pattern of culture, finds that his preceptors give him the maxims of the Sermon on the Mount as an admirable guide to conduct; he also finds that the marks of social esteem are very generally given to the successful acquisitive and aggressive individuals who have ruled their volitions according to a very different set of principles.

Neither Ego-ideals nor principles play more than a subordinate part in the determination of conduct. Much more influential are the sentiments and other attitudes, particularly those based on emotional dispositions. It is commonly said that principles of conduct are weak in motive force. This is plainly true. They are important in conduct only so far as they give direction to volitional action. The motive force they use is that of the volitional activity of the Ego. While this may be small in amount compared with the other sources of energy, we have already seen that it is not unimportant. The motive force of an Ego-ideal is probably greater because this is a sentiment as well as a directing influence on volitional activity.

## CHAPTER XVI

### SOCIAL BEHAVIOUR TENDENCIES

#### 1. Basic Factors in Social Behaviour

Everywhere we find men in groups of which the individual members are partly co-operating with each other for common ends and partly in rivalry with each other. Some writers (as Hobbes)<sup>101</sup> have supposed that his inborn nature is such as to lead man always to be in rivalry with his fellows, while co-operation is only an acquired condition which results from fear of a sovereign authority. Others (as Kropotkin)<sup>279</sup> have argued that man's co-operative behaviour is shared with the lower animals and is truly instinctive and that his hostile behaviour towards his fellows is a condition acquired as a result of the constitution of the society in which he lives. Some writers have attributed the whole of man's socialised behaviour to the operation of a single instinct often called "the herd instinct."<sup>253</sup>

The theory of a single instinct determining the fact and the form of human social organisations may safely be rejected. Human grouping is probably partly dependent on many different factors inborn in his mental constitution, not on one unitary instinct. It is true that we find widespread in the animal kingdom a tendency for members of the same (and occasionally of different species) to herd together. This has been called the "gregarious" or "herd" instinct, and is found amongst some mammals, birds, fishes and insects. Since it is found in some animals and not in others, a distinction has been made between "gregarious" and "non-gregarious" animals. No sharp line can, however, be drawn since some animals (like the

migratory birds) flock together at some seasons and not at others, some (like wolves) herd together only exceptionally and are more generally solitary or in family groups. Since, moreover, family groups may be large or small, and either more or less permanent, there is obvious difficulty in drawing the line between a herd and a family group.

The gregarious mode of life is found to a considerable extent amongst the nearest animal relatives of mankind. Both chimpanzees and gorillas are found in herds which may consist of several family groups.<sup>7</sup> Isolation seems to create for them an unpleasurable stress, only relieved by getting back to their own kind. It is probable that man also is innately gregarious, and the extreme unpleasurableness of continued isolation from other men is partly inborn and not merely an acquired adaptation to his customary conditions of life. Mere gregariousness, however, explains little that is of importance in human social behaviour—little more than that men tend to form crowds and to find solitary confinement a severe punishment.

Social life of great complexity is found very much lower in the animal scale amongst the ants, termites, bees and wasps. In all of these insects, colonies are found which are generally the offspring of a single female, and are mainly composed of unfertile females who care for the young and do the work of the nest. The single laying female is commonly called the "queen," although "mother" would be a better term. Sometimes there is not simply a single caste of workers, but several structurally different castes performing different functions in the nest. A larger insect than the worker, for example, is found amongst termites and some ants, and is called the "soldier."

There are many analogies between ant and human societies which have at all times provided parables for the moralists. Some species of ant grow fungi for food, while others tend aphids. Some ant nests contain parasitic beetles which are cared for by the ants but in return only

secrete a sweet liquid for their hosts and eat the ants' young. Some ants which are large and powerful make slaves of other species but are incapable of surviving without slaves. All of these activities suggest parallels with human societies, but the parallel is a mere resemblance. Ant societies differ fundamentally from human societies in that they are based on automatic social instincts of which certainly there are none amongst human beings, although there are probably many innate characters of man which predispose him to the acquisition of social habits and of social attitudes.

The innate dispositions of men which adapt them to a social environment are many. There are for example: the sensitiveness to other persons' opinions, which we call *suggestibility*, the sensitiveness to other persons' feelings, which we call *sympathy*, and the readiness to follow other persons' courses of action, which we call *imitation*.

Other social reactions are the disinterested emotions, and the shame which one member of a group feels when he has broken a social convention (particularly if social disapproval is expressed by other members of the group). It will be noticed that all of these reactions are ways of adapting the individual to a social environment. Harmonious and effective social grouping is dependent on the presence of these tendencies in the individual members of the group.

It is only in the sense that he possesses these peculiarly social behaviour potentialities that we can speak of man as innately social. Certainly we cannot explain the particular course of social life revealed by the history of mankind by referring it merely to a system of social instincts. The actual forms of social life in civilised and in uncivilised communities have been largely determined by the external circumstances of cultural development (such as inventions, invasions, etc.) and by economic forces. Nevertheless it is improbable that any such non-psychological forces could

have formed men into coherent and stable social groups if they had not possessed inborn tendencies which pre-disposed them to social grouping.

There are three possible explanations of the forming of social groups. First there is the explanation that the tendency to social grouping is innate—that because of the evolutionary value of grouping, man has inherited as part of his inborn constitution a tendency to develop the feelings and attitudes necessary to successful social co-operation. Secondly, it may be supposed that these feelings and attitudes are acquired as the result of each individual having from his earliest years been conditioned to a social environment. There is a third possibility which has been put forward by the Gestalt psychologists, that human beings in proximity with one another exert mutual forces which determine social grouping in the same way as the mutual forces between electrically charged particles determine their distribution in an electrical field.<sup>132</sup> Thus the laws of group formation cannot on this view be regarded as the result of their evolutionary value because they are the same as the laws of attraction and repulsion in any field in which mutual forces exist; on the other hand, and for the same reason, they cannot be treated as individual acquirements.

The first and second possibilities are not, of course, mutually exclusive. There may be general predispositions to group formation such as suggestibility which are inherited because of their evolutionary value, while the full potentialities of social behaviour are also the result of acquired social attitudes. This is the view which is here adopted. I do not find it possible to accept the view of the Gestalt psychologists on this question, although it is an interesting suggestion which should be borne in mind as a possible alternative to both of the other possibilities.

## 2. Suggestion and Suggestibility


The word *suggestion* is now commonly used for the process by which an attitude towards a system of ideas is communicated from one person to another, by a process other than that of rational persuasion. It is found that if a statement is repeated frequently and confidently, the person hearing the statement tends to believe it (or, if it

is a command, to translate it into action) without sufficient rational grounds for doing so.

This process is seen in its most striking form in the suggestions given by a hypnotizer, and an actual hallucination may be produced by this method in a hypnotized person. The hypnotizer, for example, may tell his subject that the matchbox at which he is looking has changed into a fox terrier; and the hypnotized subject will then react to the matchbox as if it were a fox terrier and apparently actually sees it as one. Some writers on this subject, as for example Janet, would restrict the word *suggestion* to these cases in which an imposed idea (possibly of an absurd kind) realises itself in consciousness with a completeness which is impossible in a normal mind.<sup>117</sup>

The word, however, is now used in a much wider sense. When people are influenced to give their votes in an election by seeing hoardings covered with repetitions of the command "Vote for Snooks," or when they are induced to buy a particular article by a mere confident repetition by the salesman of statements of its merits which they have no rational grounds for believing, they are said to be acted on by the method of *suggestion*. The three conditions favourable to the effectiveness of a suggestion of this kind are: (1) its frequent repetition, (2) the use of a confident tone of voice in making the suggestion, and (3) the possession of *prestige* by the person making the suggestion. Prestige is not a trait of the individual's own character but of the attitudes of other persons towards him. It is the social esteem in which he is held as it appears to the person receiving the suggestion.

That the capacity for reacting to suggestion has as its primary biological function the fitting of man for social life is rendered probable by the observation that the influence of suggestion from one's social environment is stronger than that from any individual. Recognised systems of belief accepted by all the members of the social group in which an individual lives tend to be





accepted without criticism by that individual. It is rarely that we have sufficient data for forming opinions of our own on questions of politics or international affairs, and most of us are content to take these opinions secondhand from the persons who surround us. In fact, it may be noticed that those opinions most purely products of herd-suggestion are held with the greatest ardour; while opinions formed more individually by weighing evidence and coming to conclusions, are held more tentatively. If this is the true root of suggestibility it means that suggestion is a social phenomenon whose function is to produce the unity of action which is essential in an effective social group.

If, however, we accept the view that suggestion is primarily a social phenomenon, we are left with the task of accounting for the kind of suggestion which is given by one individual to another (as by the hypnotizer to his patient). This may be explained as the response of a social being to the group leader. Amongst herding animals, it is commonly found that some individuals have the function of initiating herd action. Other members of the herd willingly accept the lead in matters of conduct from such herd leaders. So the individual human being acting on another by suggestion is utilising the other's tendency to respond by acceptance to directions of thought and conduct suggested to him by a group leader. He is taking the position of leader. The artificial methods used to increase the prestige of the persons from whom suggestions are to be received, such as the scarlet gown of the doctor (which was at one time worn when treating patients) and the distinctive uniform of the officer, all have the effect of raising to the position of a leader the person from whom suggestions are received.

A more serious difficulty in the way of regarding suggestion as simply a social phenomenon is the existence of the variety of suggestion called *auto-suggestion* <sup>19</sup> Some people claim to be able to make themselves go to sleep by repetition to themselves of the

formula "I am falling asleep" and even to cure some kinds of illness by similar repetition of verbal formulæ. Such auto-suggestions are probably only effective with those who are highly suggestible, and, amongst these, are less effective than similar formulæ repeated to them by other persons in the ordinary way for administering a hetero-suggestion.

When auto-suggestion is effective, it is probable that the person using it is setting into action himself a response which was primitively a method by which he was influenced by other people. It should be particularly noticed that words are used in this method, and the use of language is certainly primarily a social phenomenon. The person using auto-suggestion is trying to reproduce for himself as nearly as he can the conditions under which he would receive suggestions from a group leader. The group leader need not, indeed, be absent from auto-suggestion. When auto-suggestion was widely used a few years ago (from about 1920 to 1925) under the influence of Coué as a method of self-healing, it is very doubtful whether such effect as it had was not due mainly to the prestige of Coué who taught the method, so that it was more truly hetero-suggestion than auto-suggestion that his followers were using.

Since human reaction to leadership is not a simple thing but includes the capacity for rebelling against the authority of a leader as well as the capacity for passively following him, a too powerful attempt to impose a suggestion may result in its rejection by the person to whom it is made. This mode of reception of an attempted suggestion is known as *contra-suggestion*.\*

Thus, a judge who indicates to a jury too definitely how he expects them to return their verdict, may be surprised to find that he has roused this attitude in them and that they return a contrary verdict which is not justified by the evidence. A too aggressive manner in a person making a suggestion, which makes his hearers conscious of the fact

\* It should be noted that in true contra-suggestion this rejection is no more a voluntary action than is the acceptance of a successful suggestion. Conscious processes of thought may have a great deal to do with the subsequent acceptance or rejection of a suggestion, but the processes themselves are automatic.

that he is trying forcibly to impose his views on them is liable to rouse the same response.\*

A persistent attitude of contra-suggestion is called *negativism*. It is found in an extreme form as a symptom in some types of the mental disorder of dementia praecox. Negativism is also a phase passed through by many children. In no case is it likely that persistent adoption of the response of contra-suggestion is a sign of the absence of the influence of suggestion. Rather it is to be regarded as a protective mechanism against the patient's tendency to accept suggestions.

There are undoubtedly great differences in the extent to which different individuals are influenced by the method of suggestion. Some individuals' opinions and beliefs are very fluid to the moulding influence of mass expressions of opinion or to confident assertion by another person. These are the highly suggestible. Some others are relatively unaffected by these influences. Extreme suggestibility is found in the disorder of hysteria, in which the symptoms of bodily illnesses and such disabilities as blindness, deafness, and paralyses are found in the absence of any organic cause. These symptoms have been explained as due to suggestions of the patient's disability either given by himself or by other people.<sup>117</sup> The symptoms can also often be removed by suggestions given by a psychotherapist either with or without hypnosis, and can also be artificially created by suggestion.

Individual differences in suggestibility may be partly inborn differences. They also appear to be partly results of differences in training. The habit of receiving and reacting to suggestion appears to increase suggestibility.

\* A skilful orator who wishes to make suggestions to his audience which will be unacceptable to them, does not do so at the beginning of his speech, or he would rouse the attitude of contra-suggestion. He begins by telling his audience things they already know and already agree with (or at least are ready to receive), then, after he has got them into an attitude of enthusiastic acceptance, he is able to communicate less welcome suggestions without rousing their hostility. .

This is one of the objections to the curing of hysterical symptoms by suggestion, particularly to curing them by suggestions received in the hypnotic state. Symptoms may be successfully removed by a method which increases the high suggestibility that is the root cause of the illness. Training in prompt obedience, that is, in the prompt translation into the appropriate action of a received command, is a training in responding to suggestion. Its effect appears to be to heighten suggestibility, thus making the person trained more completely a unit in an organised group and less of a separate individual. It has been pointed out by Rivers that this is the effect of military drill and is indeed its object since the most effective fighting force is one which acts most completely as a unitary group in response to the commands of its officers.<sup>202</sup> Since military drill produces high suggestibility amongst those subjected to its influence (the private soldiers) these are prone to the typical disorder of high suggestibility—hysteria. The condition known during the war as shell-shock in which there was commonly a disability such as paralysis, deafness or blindness without organic cause was simply hysteria produced under the conditions of warfare. Rivers points out that this disorder was found only amongst the private soldiers, while those whose part in the military system was the giving of orders (officers and N.C.O.'s) might develop anxiety conditions under the stress of warfare but not the symptoms of hysteria.

How far education should be directed towards increasing suggestibility is a fundamental practical problem of the social psychology of our times. If strong group unity achieved at the price of individual separateness is desired, the road to it is the heightening of suggestibility by military drill and similar methods of education. The valuation of this end is, of course, different in different national groups and in different circumstances. In all countries it tends to be the accepted social ideal in time of war. Whether

this is a proper social ideal for all times is a question on which the ruling groups of different nations are sharply divided.

### 3. Sympathy and Imitation

Suggestion in the restricted sense in which the word has been used above (for communication of an attitude towards a system of ideas) is only one aspect of the process of mutual interchange by which members of a group pursue common ends. A herd of cattle showing simultaneous flight or aggressiveness acts as a unified group no less than a crowd of men showing fear or anger. Whereas the simultaneity of the crowd of men may be the result of mutually induced opinions which have been expressed in words, the reactions of the cattle are due only to mutually induced courses of action or emotional conditions.

Suggestion as above described may be simply the verbalised form of a more general tendency of mutual induction. In restricting the name "suggestion" to this induction of ideas, we are following the use of McDougall,<sup>153</sup> who uses "sympathy" for the induction of emotions and "imitation" for the induction of courses of behaviour.\* As a generic term to include all three types of reaction, I suggest the term "social induction."

*Sympathy* is unquestionably the source of much socialised behaviour. The effectiveness of a social group, whether of men or animals, depends largely on the distress of one member leading to sympathetic pain and relief of the distress on the part of others, and the anger of one member producing anger in others. We have already seen that emotions thus communicated from a group commonly lead to action of a more whole-hearted and

\* Rivers used the terms "intuition," "sympathy" and "mimesis" to cover these three meanings, and "suggestion" as a general term to include all.<sup>202</sup> In many ways, this would be a convenient usage but it has not been generally followed.

uncontrolled kind than that springing from the individual's self-originated emotions.\*

*Imitation* is a reaction for which the stimulus is the perception of another's similar reaction. Plainly it is not easy to be certain whether a particular piece of social behaviour is due to imitation in this sense or to sympathetic induction of emotion. In the one case, a specific piece of behaviour sets in action a similar behaviour reaction; in the other, it is the general line of behaviour that is communicated. When flight is communicated through a flock of sheep it is impossible to know whether the running reaction of some sheep sets off the running reaction of others (imitation) or the fear response of some sheep starts a fear reaction in others (sympathy). Some writers (such as Tarde<sup>232</sup> and LeBon<sup>141</sup>) have made imitation a central principle in the explanation of human behaviour but they have used the term so widely as to include all that we have called "social induction." They have also probably much exaggerated the role of social induction. Important though this is, there are other behaviour tendencies than the tendency to be moulded by the thoughts, feelings and activities of our social environment.

There was at one time an opinion in comparative psychology that the tendency to imitate was the only innate disposition of the young animal, and that all the uniformities in conduct of members of the same species was due to their imitation of other animals of their own kind. This hypothesis has, however, been conclusively disproved by experiments in which the young of various animals have been brought up in isolation from their own kind. The results of these experiments show that, without any doubt, instincts are inherited and that only a small part of the uniformity in the behaviour of the animals of any one species is to be attributed to imitation. In the restricted sense in which we are here using the word *imitation*, it is

\* See p. 78.

probably not a very important factor in human behaviour, although it certainly plays a part in the process of habit formation in children.

#### 4. Specific Social Behaviour Tendencies

Social ends are served by many of the tendencies which have already been discussed. Acquisitive and aggressive behaviour may, for example, appear as social reactions, as when the bursar of an institution is acquisitive on behalf of that institution or the aggressive behaviour of a soldier is directed towards the ends of the nation he is serving. There are also behaviour tendencies which are entirely social in their ends. Five of these are distinguished by F. C. Bartlett<sup>17</sup>: (1) the tendency of *primitive comradeship* (a relationship between equals), (2) the tendency of *assertiveness* (or dominance), (3) the tendency of *submissiveness* (the last two are both relationships between superiors and inferiors), (4) the social tendency to *conservation*, (5) a social *constructive* tendency.

The tendency to crowd together, to feel dissatisfaction at isolation and satisfaction in being one of a herd, is to be found amongst gregarious animals as well as in mankind. An isolated chimpanzee seems like something less than a whole animal.<sup>183</sup> Galton has described how an individual of a herd of Damara oxen "cannot endure even a momentary severance from his herd. If he be separated from it by strategy or force, he exhibits every sign of mental agony; he strives with all his might to get back again, and when he succeeds he plunges into its middle to bathe his whole body with the comfort of closest companionship."<sup>84</sup> This is a description of the tendency of *primitive comradeship* on a low level of instinctive behaviour. The same tendency may be seen in the relationship between human beings. Social comradeship in its purest form can only subsist amongst groups of persons, none of whom are dominant and none submissive. The

club is characteristically a social organisation designed to preserve primitive comradeship amongst a group of people.

Assertiveness and submissiveness may conveniently be treated together. There is a tendency which will very quickly be observed in any human social group for some members to push themselves to the fore while others voluntarily submit themselves to their dominance.\*

Galton noticed this dual relationship also amongst Damara oxen.<sup>84</sup> While most of these animals show an incapacity to rely on themselves and a faith in others, and are willingly led by any one of their number who has enough self-reliance to accept that position, a certain number of them show a peculiar amount of self-reliance. These are noticed by the men who bring them in because they graze apart from, or ahead of, the others. They are broken in as fore-oxen and their lead is willingly followed by the others. We have already seen a similar acceptance of submission amongst the cows of Thion<sup>18</sup> (cf. p. 185), but in this case the leader was not allowed to retain that position merely by the possession of a tendency to dominate, but had to fight for it.

Of particular interest for their resemblance to certain phenomena of human social stratification are Schjelderup-Ebbe's observations on the pecking order of domestic fowls and certain other birds.<sup>132</sup> He found that fowls which had lived together for some time had established an order of dominance, so that A pecked B who accepted the blows, B pecked C who similarly accepted the blows, and so on. Those low down in the pecking list tended to show greater severity to those few below them than did those high in the list, and became milder and even friendly when those above them were removed. This also is analogous to something that may be observed in human social groups.

\* Probably both assertive and submissive tendencies are to be found in every individual, and the person dominating one social group may be submissive in another. A man may show assertion in his family, while he is submissive in the office where he earns his living in a subordinate position.



The order of dominance was not always a simple one; such irregularities might be observed as a triangular structure in which A pecked B, B pecked C and C pecked A.

In groups of human beings, it is similarly noticed that there are some who tend to come to the front and to dominate others and that their dominance may be accepted by other members of the group. These are known in popular speech as persons of strong or dominating personalities. They belong to the type of leader called by Conway the *crowd-compeller* (e.g. Napoleon, Disraeli, etc.).<sup>52</sup> A group may, however, not only possess a leader; it may also have within itself a structure resembling that of the pecking order of birds which results from some of the members being dominant over others while themselves subservient to the leader.

These dominances by a leader and the relative dominances of other members of the group may be institutionalised in a group because a group articulated in this way becomes more effective for certain purposes. Thus in an army there is not only a leader but also an elaborate institutionalised "pecking order" of field officers of various ranks, junior officers, warrant officers, non-commissioned officers and privates, and this kind of articulation in an army appears to be essential to its successful functioning.

The *tendency to conservation* is the tendency to prefer the familiar in one's social surroundings to the unfamiliar. It may be seen at work in the strong sentiments which are built up round existing institutions and which cause opposition to their change. It is to this tendency that institutions often owe their survival beyond the time when they serve useful social purposes. It is seen at work in the sorrow and indignation felt by many people at such changes of familiar institutions as would be involved in the abolition of the monarchy, or of the House of Lords, or in a change in the structure of the Book of Common Prayer. Of, course, the people who oppose such changes

do so partly because they believe that the institutions threatened serve a useful social function.

If, however, we examine our own feelings with respect to some change to which we are strongly opposed, we shall find that over and above any belief in the usefulness of the institution threatened, we have strong emotional reactions called out by our mere desire that it should not change. Men who served with a brigade during the war, which was so depleted in numbers that it was fused with another brigade and lost its individuality, felt pain at the change, which was little reduced by the fact that the new mode of organisation was of greater military value.

This attitude of opposition to changes in social institutions may be called *conservatism*.\* The attitude of conservation is one which tends to grow stronger with age, and Rivers has pointed out that the element in a tribal organisation which stands for conservation is its old men.<sup>203</sup>

Bartlett has pointed out that the tendency to conservation is selective in its nature.<sup>17</sup> No social group preserves all its institutions. We may take, for example, the case of marriage restrictions and the corresponding relationship terms. Under changing social conditions, both of these may ultimately disappear, but the relationship terms long outlast the marriage restrictions. The system of naming which belongs to a clan organisation with exogamic grouping is found, for example, still to persist amongst many tribes of North American Indians, although the social organisation itself has quite disappeared.

*Social Constructiveness* is the tendency to make new social organisations. In every social group, we can observe this tendency to bring together various social elements in new institutions.

We find it at work amongst the undergraduates in a University who are always forming amongst themselves various

\* This attitude is not, of course, to be identified with political conservatism, although no doubt much of the emotional strength of political conservatism is supplied by this innate quality of character. It may, however, also be strong in those who are not political conservatives.

clubs and societies which, having no strong tradition which can promote sentiments of loyalty leading to social conservation, do not generally very long survive their founders. From a study of the formation of new religious sects, one is led to the view that the social constructive tendencies are particularly strong in the persons we have already described as group leaders, and that new social organisations generally tend to be built around them. The tendency to social constructiveness is generally, although not necessarily, found to be in conflict with the tendency to social conservation. In fact, the conservation tendency seems to oppose the formation of new social institutions as well as trying to conserve old ones.

### **5. The Hypothesis of the Group Mind**

As social psychologists we wish to understand the interactions of social groups. We wish to understand how group rivalries develop, how some groups become dominant, and how wars and revolutions arise. We must begin by rejecting a principle of explanation which, however, attractive it may appear at first sight, is untenable. This is the hypothesis that group activities are directed by a mind corresponding to the mind of an individual but belonging to the group as a whole.

There is probably less real difference of opinion on this subject than may appear at first sight. The controversy between those who affirm and those who deny the existence of a group mind is very largely verbal. Neither disputant denies that a group has its own characteristic ways of reacting which may be different from those of its individual members. This may be all that is meant by asserting the existence of a group mind. It may not be meant that a group has a consciousness of its own different from the separate consciousnesses of the individuals composing it (although this also has sometimes been asserted). McDougall has said, for example: "We

may fairly define a mind as an organised system of mental or purposive forces ; and in the sense so defined, every highly organised human society may properly be said to possess a collective mind."<sup>153</sup> Those who dispute this conclusion, however, refuse to define a mind in this way.<sup>160</sup> Although they might not dispute the proposition that a society possesses an organised system of mental forces, they would not therefore attribute to it a mind.

The controversy is, therefore, primarily one of how the word " mind " is to be used. So far as a verbal question can be settled, it must be by an appeal to common usage of words as shown by the dictionary, and this authority does not seem to support McDougall.\* If we refer to a " group mind," it must be by a use of the word " mind " so different from the customary one that the term will tend to be very misleading.

If, on the other hand, we use the word " mind " in the ordinary sense, as a term implying the possession of consciousness and the power of consciously directing behaviour to achieve deliberately chosen ends, there is no justification for applying it to social groups. If a group had consciousness, that consciousness would, of course, be as inaccessible to our knowledge as the consciousness of another person. The pursuit of deliberately chosen ends is, however, an observable fact of behaviour, and it is not to be observed in group behaviour except so far as this is directed towards ends chosen by the will of one or some or all of the group members—as when the will of Napoleon chose ends to be attained by the movements of his armies or when the Paris crowd pulled down the Bastille because they all intended to.

The results of group behaviour may be truly purposeless even when they pursue a constant direction which suggests a deliberately pursued end. Each member of a

\* *Concise Oxford Dictionary*. " Mind (n.): . . . seat of consciousness, thought, volition, and feeling."

social organisation may pursue his own purposes and the resultant effect may be something which no one has foreseen or intended. Thus the reorganisation of English social life which resulted from the Industrial Revolution was not consciously aimed at by the industrialists by whose activities it was very largely produced. They were concerned to make profits for themselves by building factories and utilising the sources of power. One of the results of the activities of this period was the increased power of the middle classes, but to say that the middle classes were pursuing the aim of achieving economic power would be to suggest a deliberately chosen aim for a process which was almost entirely planless. The industrialists each pursued their own private aims and their rise to power was not an end consciously accepted either by the industrialists as individuals or by any "group mind" of the industrialists as a whole. It was a mere resultant which was neither planned nor foreseen.

Explanation of the behaviour of a social group by the hypothesis of a group mind has, therefore, neither theoretical nor practical foundation. We can best understand and learn to control social forces if we bear in mind that except in so far as they are dominated by individuals who have deliberately chosen their purposes, social groups move towards ends as blindly and mindlessly as does a glacier or a slime-mould.

We must, I think, guard ourselves against two popular errors in the estimation of social forces. One is that of attributing to social forces the directed and volitional character which belongs only to individual behaviour. This is the error of supposing that there is a group mind. The man in the street, for example, is easily persuaded that some foreign country (let us call it, to avoid offence, Cambodia) has become malevolent, is planning war, and must be punished as a criminal. In truth, if war is being planned, it is being planned by some ruler or group of influential people in Cambodia. Cambodia is as incapable of planning a war as is a river of planning a flood.

He is, however, also easily led to the opposite error of denying

the existence of social forces. He may go for a holiday to Cambodia. He finds the people friendly and kind, and surprisingly like himself. He decides that there is no threat to peace from Cambodia itself although possibly its rulers may desire war. He may now be as badly mistaken as before. There may be social forces in Cambodia which, under the direction of a ruling group, will produce war. The existence of these forces is quite consistent with most of the people not desiring war and being friendly to strangers. The group tensions of Cambodia may be as dangerous as the headwaters behind a dam on which a lunatic is standing with a spade. The direction in which those tensions are discharged will, however, either not be a consciously chosen direction or will be consciously chosen by some individual or group of individuals.

Absence of conscious direction of social tension is often seen in the early stages of a revolutionary outbreak. The final success of a revolution, however, is the result of the liberated social forces having been directed to ends deliberately chosen by revolutionary leaders. The dissatisfaction of an oppressed people may have supplied the energy behind the Russian Revolution, but the new social structure of the U.S.S.R. was the result of a plan deliberately chosen by Lenin and the other Bolshevik leaders.

## CHAPTER XVII

### SOCIAL GROUPING

#### 1. Social Groups

In a large herd of animals, it is found that there exist smaller groupings of animals that tend to keep together. In the same way, in human societies, there are smaller bodies of men or women or both who are bound together by kinship, by a common set of political beliefs, by a similar occupation, by common tastes in sports, or simply by friendship. Within each of these bodies, there is more of the attitude of primitive comradeship than between members of different groups and a certain tendency to exclude from the body and to adopt a relatively hostile attitude towards those who are not members. All such bodies may be called "groups." We may define a group as a more or less segregated body of people. The term segregation we have already met in our discussion of perception;\* its use in social psychology is the same. A segregated part of the visual field is one which while belonging to the total visual field also possesses a certain unity of its own by which it is, as it were, separated from the rest of the field and ceases to be merely a part of it. So also a social group possesses a unity of its own which separates it from the larger group to which its members also belong.

Modern civilised society is a complex system of inter-related social groupings. An individual is a member of many groups with very different and often intersecting boundaries. He is a member of his own town or village. He is also a member of a large family group with vague outlines probably extending over

\* See p. 240.

many districts and of the smaller more segregated family group of himself, his wife, and his children. He is also a member of a church or a political organisation, either or both of which may be institutions with boundaries extending beyond his own nation. Much of his behaviour is determined by the fact that he is a member of a particular social class although social tabus may prevent him from being as conscious of this social grouping as of the others. He may also be a member of an occupational institution, such as a trade union or an international society of microscopists or sociologists. This too may have boundaries extending beyond the limits of his own nation. He may feel more similarity and enter more readily into the relationship of primitive comradeship with a Japanese member of his own international occupational society than he does with a member of his own nation who belongs to a different social class.

A social group may be more or less internally cohesive and more or less segregated from the other parts of the larger group of which it forms part. These two characters of internal cohesiveness and external segregation are very generally in direct proportion to one another although probably not always. McIver<sup>160</sup> uses the word *association* for a group organised for the pursuit of some common interest, and *community* for the more strongly knit kind of group occupying a single geographical area and bound together by their common life. Unfortunately, other writers have used these terms with other meanings (*e.g.* Alverdes<sup>7</sup>), although still with the implication that an association is a less segregated and cohesive group than a community.

There are many factors determining the amount of unity which exists between the members of a social group and the amount of separateness between them and individuals outside the group. First there is the factor of difference or resemblance. On the whole, we tend to form social groupings with those who are like ourselves, in speech, in manners, in skin colour, in dress, etc. As the



resemblance becomes less, so also does the tendency to form social groupings. A black man and a white man may be drawn together by the possession of common interests but the external difference between them renders this drawing together very much less probable than if both were white or both were black. Let us call these differences which determine social groupings "group distinguishing marks." On the whole, the formation of social groups takes place between those with similar group distinguishing marks while segregation will tend to take place between groups whose members have different group distinguishing marks.

Other factors which determine the formation and the degree of segregation of social groups are the extent to which their members think of themselves as a social unit (their *group consciousness*) and the extent to which they have formed sentiments (or attitudes) towards the group or its leader.

## 2. Group Consciousness

The internal cohesiveness of a social group and its power to act as a unit in competition with other social groups depend to a large extent on the extent to which members of the group are aware of the reality of the group and of their own membership of it. This awareness may be called *group consciousness*; specific examples of group consciousness are race-consciousness, national consciousness, and class-consciousness; in which individuals are aware of themselves as members of a particular race (which may, of course, from the point of view of the anthropologist, be a real or a fictitious one), a particular nation, and a particular social class respectively.

"Group consciousness" is used to describe this fact of being aware of group membership since the word "consciousness" is already used in this sense in ordinary speech in such terms as "race-consciousness" and

"class-consciousness."\* It must not be supposed, however, that group-consciousness is a purely psychical fact. It has also a behaviour aspect, and generally must be studied from that side without reference to the thoughts or feelings of the group members. It might be described from its behaviour aspect as the verbalising of the group relationship. From the side of behaviour, the evidence of group consciousness in the members of a group is to be found in their referring to themselves by a name indicating membership of the group (as "Englishman," "Nordic," "Presbyterian," "worker," etc.), in their tendency to extend the behaviour of primitive comradeship to other members of the group in preference to those who are not members, and in their tendency to adopt standards of behaviour (of manners, speaking, eating, dressing, etc.) characteristic of the group.

The absence of group consciousness may be the determining factor in preventing a group from taking co-operative action. The blue-eyed people of Great Britain, for example, are not group conscious. If it were desired to make them take violent action against the brown-eyed, it would be necessary first to give them a distinctive name, and to make them think of themselves as members of this blue-eyed group and identified with its interests rather than as members of the British people as a whole.

It was reported by travellers (I do not know how truly) that, early in the nineteenth century before the beginnings of their revolt against the Turkish rule, the people occupying the country we now call "Bulgaria" had very commonly no name which they gave themselves as a distinct people. If this was so, the first condition for a successful rising was that they should think of themselves as "Bulgarians," *i.e.* that they should become race-conscious. Similarly Marx when trying to prepare for a proletarian

\* "Group consciousness" has sometimes been used to stand for a conscious mind belonging to the group which is different from the individual minds of its members. This hypothesis we have already rejected (pp. 319 ff.).

revolution, rightly considered that it was necessary that the working classes should become "class-conscious," that they should think of themselves as forming a separate class from the rest of the community with interests that were peculiar to them. Governments that do not want a proletarian revolution aim at the reduction of class-consciousness and the intensifying of national consciousness. Those whose aim is to prevent national wars similarly see a danger in national consciousness and would rather intensify consciousness of memberships of larger units (so that, for example, an individual would think of himself as a European rather than as an Englishman or German).

### 3. Group Loyalties

Group consciousness is a way of thinking about a social group; group loyalty is a way of feeling about it. The mere fact that a man is aware of his membership of a particular social group (that he is group conscious) will not in itself make much difference to his behaviour. Its importance lies in the fact that then and only then can he have a sentiment or other attitude towards the group. His sentiment about a group to which he belongs may make a very great difference to his behaviour.

Loyalty is a particular kind of sentiment (or attitude) of an individual for a social group of which he is a member, one which leads him to continued co-operative effort with the group.\* Since every individual is a member of more than one social organisation, he has a complicated system of loyalties which sometimes conflict with one another. He has, for example, his loyalty to his cricket club, to his church, to his business, to his own town, and to his nation.

\* In a leadered group, the sentiment may be centred, in part at least, on the leader. Since, however, the leader is an object of loyalty as representative of the social group, this case is sufficiently covered by the above definition.

An intense loyalty to one group does not necessarily cause hostility to another group, nor does it necessarily involve decreased loyalty to a large group of which the group in question is a constituent part, although both results may follow. A Manchester man's loyalty to Manchester does not prevent him from co-operating with a Liverpool man in the defence of England when there is a war. In fact, it is usual in an army to encourage group feelings about the smaller units—regiments, companies, and even platoons—because it is believed that the general tendency to form loyalties will result in an increased loyalty to the larger organisation of the army as a whole. This is what is called inculcating *esprit de corps*.

On the other hand, hostility towards certain other groups may be part of the total attitude towards a group and may indeed contribute much to its strength. Probably there is no force that unites men more strongly than a common hate, and those who wish to bind together the members of a group in a strong sentiment of loyalty may do so most easily by finding a group enemy for the members of their own group to hate. There is probably always some tendency for hostility to develop between segregated groups. This tendency may be increased by the external facts that the groups are competing for the same ends, or by deliberate increase of group hostility as a means producing unification within the group.

The sentiments of loyalty for nations (i.e., sentiments of *patriotism*) commonly include, as part of their system, hostility towards other national groups. Loyalty to the smaller group of the nation does not, therefore, commonly lead to loyalty to any larger groups of which the nation is part. When, as at the outbreak of a war, hostile attitudes against other national groups are strengthened there is a noticeable increase in the patriotic sentiment. There may, therefore, be real incompatibility between patriotism and any wider allegiance. For this reason, the inculcation of international sentiments or of loyalties for groups transgressing national boundaries is commonly discouraged by strongly nationalistic rulers.

It is neither true to say "A good patriot is also a good European," nor to say "The internationalist cannot be a good patriot." Whether a patriotic sentiment does or does not conflict with international sentiments depends on how far it includes attitudes of hostility with other national groups. This depends on the nature of the social influences which have built up the sentiment.

The nations themselves are unified groups which have grown out of smaller groups that, at one time, claimed exclusive loyalties which were inimical to the growth of a sentiment for the nation as a whole. Ibsen in *The Pretenders* portrays the conflict between the Duke Skule and King Haakon, standing for the feudal and national sentiments respectively. He shows Skule awed at Haakon's conception of a loyalty which should extend to Norway as a whole. Skule realised that he himself belonged to the more primitive psychological stage of development to which smaller loyalties alone are possible, and that no other claim to the throne was as strong as Haakon's "great kingly thought" of a united Norway.

We are now at a stage of social development when the natural unit of our loyalties is the State, and when, on the whole, smaller loyalties are subordinated to and organised within the sentiment of patriotism. But there seems neither psychologically nor sociologically a reason why the state should be regarded as the final point to which loyalty can extend. *Internationalism*, or the feeling for a community of men wider than the limits of one's own individual state, is a development beyond nationalism corresponding to the step from feudalism to nationalism. Social and economic developments are making the inter-dependence of nations more important than their rivalries.

There is no psychological barrier to the formation of the kind of loyalty that is required by internationalism. Already we have in the Christian churches, in the British Empire, and in international socialism, social organisations wider than national boundaries, which call out from their members loyalties which transgress the limits of the state. The passage from exclusive patriotism to a patriotism subordinated to and organised within an international sentiment is as essential a step in the mental development of our time as was the passage from feudal to national sentiments in the days of Duke Skule and King Haakon. Attempts at the present day to build up exclusive patriotic sentiments may be as dangerous as were the efforts of Skule to bolster up the old narrow feudal loyalties.

#### 4. Social Institutions

One of the ways in which a social group increases its internal cohesiveness and secures its permanence is by giving itself a formulated organisation. This organisation is a social institution.

Thus a number of men may meet casually at a restaurant drawn together by a common interest in art or in socialism. They are already, to a considerable extent, a group and not an unorganised aggregate, because their aggregation has a social purpose, that of discussing the subject of their common interest. After a time, it is suggested that they should form themselves into a club with a secretary, a constitution, and definite times of meeting. This club may continue as an entity long after its members are all dead. It is a social institution.

Social groupings which are not institutionalised may also be strongly segregated and permanent. Membership of the middle classes is as definite a fact in a man's social life as is his membership of the Wesleyan Methodist Church, although his social class has no president or secretary, no constitution and no rules of membership.

Perhaps the main psychological difference between social groups based on institutions and those that are not institutionalised is that the possibility of the absence of group consciousness is peculiar to non-institutionalised social groups. A man may or may not have a sentiment of loyalty for an institutionalised group to which he belongs, but he cannot fail to be aware of his membership of it.

#### 5. The Group Leader

A group may be organised either with or without an individual occupying the position of group leader. This difference may also be observed in animal grouping. It is probable that a group without a leader may nevertheless be unified and closely organised. For certain practical

purposes, however, the lea<sup>dered</sup> group is the more effective unit. If the function of the group is to oppose another group (the function of armies, trades unions, federations of employers, etc.) or to accomplish effects in the outside world (the function of a workshop) or merely to come to a joint decision (as in a committee), the condition for effectiveness in action appears to be some sort of organisation with a leader or (as in an army) with a leader and a hierarchy of subordinate leaders.

It has been observed amongst groups of children playing or engaged in any other co-operative activity that some readily adopt the position of group leader and are accepted in this position by the remainder of the group. A certain amount of study has been given to the necessary characteristics of the group leader. It has been suggested that any individual characteristic favourably regarded by the group will tend to give its possessor the position of group leader by differentiating the individual in question from the remainder.<sup>132</sup> It has been observed that the leader amongst children is commonly of greater intelligence than the average of the group but that too great a difference is unfavourable to leadership.<sup>39</sup> Observation of the leaders of adult groups seems to suggest that the undeviating behaviour of the individual with strong perseverative tendencies helps to make others follow him and that the unchanging convictions even of the paranoid individual may have the same effect.

In many cases, as on a committee, the position of leader may be held only temporarily while the end of the group is in the process of attainment. Sometimes the relationship between leader and led or the more complex relationship of a hierarchy of leaders is maintained permanently, and in this fact we probably have part of the origin of social stratification into superior and inferior social classes.\*

\* The terms "superior" and "inferior" social classes will be used frequently. It is necessary to make clear that these terms are used in a severely technical sense to mean only superiority

Permanent superior-inferior relationships are probably due to many different causes. There is, first, the tendency for sentiments to persist; the sentiment of respect felt by the inferior for the superior remains, and, so far as this sentiment (and the opposite sentiment of the superior for the inferior) underlies such social grouping, the relationship tends to be permanent.

An equally important fact is that for the attainment of the ends of the social organisation for which the superior-inferior relationship has been employed, a permanent relationship is often the most efficient. The germ of the superior-inferior relationship is perhaps to be found in the family. The same kind of organisation may be supposed to have been carried over into such early groupings as those intended to secure the ends of religion and of warfare. It is certain that for warfare, and it was supposed that for dealings with the gods, a permanent superior-inferior organisation was the most efficient. A committee may work as efficiently at its next meeting if a fresh member is in the chair, but an army with the relationship between commanders and those under command reversed would be an inefficient fighting organisation. Furthermore, some are more fitted for the position of leadership than others, either through superior intelligence or through a greater innate assertiveness, so that, even with no permanent superior-inferior social organisations, and inferiority in the scale of social stratification. Stratification is a fact of social organisation which we can recognise by various marks, perhaps most easily by noticing that the member of a superior social class gives orders to one of inferior social class while the other obeys them, and that there is a social obligation on the member of the inferior social class to use gestures or methods of address indicating respect which the other is not under the same obligation to reciprocate. Many of the differences are external signs of a relatively intangible but very real difference in social prestige attached to different classes. The use of the term "superior" in this connection does not imply that the member of a socially superior class is superior in intelligence, social usefulness, or in any other respect except that of occupying a higher position in a stratified social system.



these would tend always to be in the dominating position in every new social group.

Various other factors tend to make this relationship permanent. The superior group may, for example, be of different race and of different colour (as was true to some extent of the Indian castes). Hereditary titles and hereditary wealth make it possible for some families always to remain in superior positions in social groups. Differences in speech and custom similarly tend to make these divisions permanent. It is obvious that while the ability to act as leader is to a certain extent innate, so that the hereditary qualifications for leadership may be based on sound biological principles, inheritance may also place artificially many men in the position of group leader who have no innate capacity for this position.

## 6. Codes of Manners

The adjustment to one another of members of a social group is facilitated by customary forms of speech and action, such as those of greeting, farewell, etc. These differ from one social group to another, both in their form and in their total quantity. They may be called *social obligations*, and the whole system of social obligations of any group may be called its *manners*. Manners differ not only in different areas but also in different social classes in the same area. In many countries of Europe, it is customary for men meeting to kiss each other on both cheeks, under circumstances in which in Great Britain or the United States they would shake hands. In Arab countries, they would touch their breast and forehead after shaking hands and would go through a complicated formula of greeting.

There are similar differences of manners between different social classes in the same area. Removal of the hat is, for example, a commoner social obligation amongst the leisured classes in Great Britain than amongst the

working classes. There is, however, no general rule that social obligations are greater in amount or more rigid in higher social strata. In Central Europe the peasants observe far more social obligations than do the middle classes (such as greetings on meeting strangers and good wishes before eating). This is probably due to the fact that such social obligations are declining and that this process is less advanced among the more conservative peasants.

The total quantity of such social obligations is less in some groups than in others. In Spain and Morocco, for example, the correct things to say and do in various social situations are prescribed in greater detail and observed with greater rigidity than in the relatively less mannered countries of Great Britain and Northern Europe. To say that one country has fewer manners than another is not, of course, to say that its members show less courtesy than those of the other, although this also may be true. It is a requirement of courtesy to observe the code of manners of the social group in which one is mixing, but it is equally a requirement of courtesy to avoid those manners which are not customary to the group.

It would be a matter of considerable interest to social psychology if some research investigator would give an accurate comparative account of the social obligations observed in different social classes within our own country as an anthropologist would do for a primitive society. This has, so far as I know, never been done. A beginning of such studies is to be found in the book of "etiquette." This is an account of the social obligations observed by the upper social stratum with the unscientific suggestion (based on the tendency to imitate superior social strata) that this is the "right" system of social obligations for everyone.

The possession of a code of manners facilitates social intercourse and the adoption of the attitude of primitive comradeship within the group. It may also serve to

increase the separateness of the group from other groups. One of the difficulties which prevents an individual from establishing the relationship of primitive comradeship with a group of different nationality or of a different social class is the fact that he has a different code of manners. Manners may thus form a group distinguishing mark.

They may also serve to mark the relationship of superior and inferior in different social strata. Between equals the social obligations of manners are reciprocal—an obligation of behaviour or speech of A towards B is equally an obligation of B towards A. Other social obligations, however, are non-reciprocal. A is required to adopt a certain form of behaviour or speech towards B who is socially superior, although this obligation does not exist or exists in a different form from B to A.

Non-reciprocal social obligations are to be found both in speech (the use of titles of respect) and in forms of behaviour. Malinowski reports that in the Trobriand Islands, a man passing a social superior must adopt a crouching attitude, the social superior also has the obligation to rise if he is sitting down so that the man passing him may be lower than he is.<sup>163</sup> Similarly a social superior in our own country expects to be addressed as "Sir" or "Madam" by a social inferior but does not reciprocate this form of address. In some cases also the hat is raised by a social inferior while the social superior responds with an attenuated salute. When both parties in a social rite perform a similar action, it may be given a non-reciprocal character by the obligation of the social inferior to perform the action first.\* Thus the army salute is a non-reciprocal social obligation; the private soldier "salutes" an officer, while the officer "returns his salute."

\* "A learned man used to say, that if a minister of the word and an angel should meet him together, he would salute the minister first which methought was a little too high." (Pepys's Diary, Aug 9th, 1663.)

## 7. Social Classes and Social Stratification

The most conspicuous social segregation that exists in human society is that between members of different nations. These have well-marked group distinguishing marks, differences of language, of manners, and sometimes of skin colour, while intercourse between them is made difficult not only by these differences but also by the obstacles to travel, some of which are natural while others are imposed by human regulations.

There is segregation hardly less extensive between different social classes within the same country. These too are separated by lesser speech differences and differences in manners which make social intercourse difficult. Sometimes there may even be differences in race and skin colour. Since different social classes in the same area very commonly differ in customs, manners, speech, and in other respects, it is not scientifically correct to speak of the prevalent behaviour of a particular area when the object of study is a civilised society. It is also necessary to indicate to what social class within that area the observations refer

These differences between different social classes form group distinguishing marks which help to form classes into more or less segregated groups. The segregation is incomplete since class boundaries are indefinite. The indefiniteness of boundary, however, does not make the differences between social classes any the less a real one. The difference between a typical Spaniard of the working classes and a typical middle class Spaniard are, no doubt, entirely (or almost entirely)\* acquired and not inherited. They are the result of the development of different attitudes, habit systems, etc., which are formed by a different social tradition and a different economic situation. Nevertheless, this difference may (except in speech) be greater

\* I say "almost entirely" because there are sometimes different racial strains in different social strata. I do not know whether this is the case in Spain.

## 7. Social Classes and Social Stratification

The most conspicuous social segregation that exists in human society is that between members of different nations. These have well-marked group distinguishing marks, differences of language, of manners, and sometimes of skin colour, while intercourse between them is made difficult not only by these differences but also by the obstacles to travel, some of which are natural while others are imposed by human regulations.

There is segregation hardly less extensive between different social classes within the same country. These too are separated by lesser speech differences and differences in manners which make social intercourse difficult. Sometimes there may even be differences in race and skin colour. Since different social classes in the same area very commonly differ in customs, manners, speech, and in other respects, it is not scientifically correct to speak of the prevalent behaviour of a particular area when the object of study is a civilised society. It is also necessary to indicate to what social class within that area the observations refer.

These differences between different social classes form group distinguishing marks which help to form classes into more or less segregated groups. The segregation is incomplete since class boundaries are indefinite. The indefiniteness of boundary, however, does not make the differences between social classes any the less a real one. The difference between a typical Spaniard of the working classes and a typical middle class Spaniard are, no doubt, entirely (or almost entirely)\* acquired and not inherited. They are the result of the development of different attitudes, habit systems, etc., which are formed by a different social tradition and a different economic situation. Nevertheless, this difference may (except in speech) be greater

\* I say "almost entirely" because there are sometimes different racial strains in different social strata. I do not know whether this is the case in Spain.

than that between a Spaniard and a Portuguese who are both of the same social class.

One of the most important features of class differences is that they are commonly accompanied by a difference in social valuation which we shall call *social stratification*. This means that certain social classes are generally regarded as "superior" to others.\* Social stratification does not merely imply that members of some classes esteem themselves as socially superior to others but also that this difference and the obligations it entails are accepted by the others.

Social classes exist wherever people differing in occupation, in racial origin, etc., form more or less segregated groups within the same area. Social stratification exists when such segregated classes have also a superior-inferior relationship to each other. Division into social classes and their gradation into social strata may be definite and institutionalised as in the caste system of India, or indefinite as amongst ourselves. The word "caste" is probably best reserved for a definite and institutionalised system of social stratification.

General recognition of the problems connected with social classes and particularly those of social stratification are rendered difficult in our own society by the existence of a strong social tabu on verbal recognition of the fact of social stratification. Reference to the existence of superior and inferior social classes would generally be recognised as an unpardonable error in taste. A member of the upper classes who insisted on non-reciprocal obligations of manners from his gardener and who in all other respects behaved to him as to a member of a different and inferior social class would be shocked at a verbal formulation of this difference. This tabu (like many others) must be broken by the social psychologist

The tendency to segregation between different social classes is partly maintained by the existence of such group distinguishing marks as differences in the details of speech,

\* The use of this term has already been explained (p. 331 n.).

of manners, and of customs. Food habits, for example, form a group distinction between different classes and different social strata. In the Trobriand Islands those of noble rank are prohibited from eating certain foods (such as bush pig) and feel that such food is disgusting.<sup>163</sup> The outcastes of India eat birds of prey, which seem disgusting to Hindus of higher caste. Members of the higher social classes in our own country do not generally eat shrimps, winkles or bloaters, while those of lower social strata usually do not eat and do not like caviare or venison.

Class distinguishing marks tend to vary at different times and even to become reversed in their indications as a result of a tendency of members of inferior social classes to adopt the characteristics of superior social classes.\* This tendency is frequently rationalised by reference to the manners of speech and the social customs of superior social classes as the "correct" ones.

The basis of class differences in a society may be differences in occupation, in race or in wealth. It may also be any combination of these. The matter may be further complicated by a man's social position being partly inherited, so that it is partly determined by the occupation, race or wealth of his ancestors. The importance of the inherited factor is, of course, increased by the inheritance of titles since these serve to form group distinguishing marks of those whose claim to social prestige rests on their ancestors, whereas, in the absence of these marks, the social position of their ancestors would be forgotten or, at least, unverifiable.

The most important occupational difference is that between the governing and governed classes. Originally the upper classes meant the governing classes. Since the functions of government were handed down from father to son, and the group difference of the upper classes was reinforced by titles of distinction, they tended to form a

\* This tendency may be peculiar to social structures like our own in which class membership is relatively unstable.

highly segregated group, a tendency which is now less strong, since, in the relatively democratic organisation of our nation at the present time, many of those who actually perform the function of government are not descended from members of this class while others who do belong to this class by descent, play no part in government. Also the titles of rank which served as group distinguishing marks have often been given to those who are neither themselves members of the governing class nor descended from members of the governing class. Instead of a sharply segregated social class, therefore, the upper class is one with a segregated nucleus and fringes which are not sharply divided from other classes.

The remainder of social stratification is determined by two main principles: the inferiority of the seller in the buyer-seller relationship, and the much greater social inferiority of manual labour. The first principle determines the line which is drawn between those who are "in trade" and the professional classes—lawyers, accountants, etc. The second determines the line between all black coated workers and members of the "working classes." Other factors may serve to make these lines less distinct than they would be if these principles alone determined them. Great wealth, for example, makes it possible for its possessor to adopt the habits of living of an occupational class higher in the scale of social stratification than his own.

In many ways the most important line in the system of social stratification is that drawn between those who do and those who do not engage in manual labour. It is seen most clearly in countries with a difference in race between the superior and inferior social classes, where there is a tendency for all manual work to be done by members of the inferior race. Those members of the superior race who engage in manual labour lose much of the prestige attached to their membership of the superior race. Although somewhat less clearly defined in racially homogeneous communities, this line of social stratification



remains a fundamental one. When Marx wished to indicate the difference between social classes, he made a division into two classes only, the "bourgeoisie" or privileged class above this line and below it the "proletariat" or unprivileged class.

The social importance of the line of cleavage between the working classes and the middle classes depends, of course, largely on economic factors, on the fact, for example, that the worker has to sell his labour for wages in conditions more unfavourable to him and at a much lower price than does the average member of the middle classes (although not necessarily under worse conditions than the most lowly paid members of the middle classes).

What has been said above refers to the class system as it exists in Great Britain. In the U.S.A. the situation is somewhat different, although this difference is not correctly expressed by saying that there are no class differences in the U.S.A. The distinctions between occupational groups are less marked and there are fewer non-reciprocal social obligations of address. Also there are fewer reciprocal obligations of address. An American chauffeur will address his employer in much the same way as the employer addresses him, and the address of both, judged by European standards, will seem to be discourteous. It is mainly this absence of non-reciprocal obligations of address which is meant by the statement that Americans are more "democratic" than Europeans in their social contacts.

Occupational differences are less indicative of differences on the social scale because they are less permanent, and less accompanied by recognisable group distinguishing marks. Whereas, in Europe, it is usual for a man to continue in one type of occupation during his life and for that occupation to belong to the same social level as that of his father, it is possible in America for the son of a professor to be working as a bricklayer, although possibly at the same time he is preparing himself to become a professor or a business executive. At the same time, such group distinguishing marks as manner of speech and dress are not as great between the bricklayer and his employer as they would be in Europe.

There seems, however, to be a clear consciousness of class superiority of those holding executive positions in any occupation. This dividing line corresponds to that between the middle classes

and the working classes in Europe, although perhaps not drawn in quite the same position.

So far as one can judge from American fiction and occasional controversies in American papers, there are, in some parts of the U.S.A., superior social classes which are to some extent segregated and endogamous. Membership of these classes seems to depend less on the exercise of governing functions than in Great Britain. There is probably less tendency for members of other classes to imitate the characteristic marks of superior social groups in behaviour and speech.

The fundamental class divisions in the U.S.A. are those based on racial distinctions. Particularly strong is that between those of pure white blood and those known to have any negro ancestors. Less strongly marked is the division between those of North European ancestry and those of South European origin. The group-consciousness of those of the superior racial classes is reinforced by the derisive terms "nigger" and "wop." Such a class distinction as that between white and black is, of course, made easier by the existence of clear group distinguishing marks (skin colour, straight and curly hair, etc.). The class distinction between whites and negroes is partly an occupational one since negroes find it difficult or impossible to find employment of high occupational status.

Class differences and social stratification thus exist in the U.S.A. as in Europe. In many respects they are less marked, but in others they are deeper. There are, for example, no differences in Europe so great that the superior class would not worship in the same churches as the inferior class.

It is obvious that any account that can at present be given by the social psychologist of social classes and of class stratification suffers from the lack of any information of comparable reliability with that gathered by anthropologists about the customs of primitive people. Until such information is obtained by field workers in social psychology, any such account as the above can only be regarded as an imperfect preliminary to a truly scientific treatment of the question.

## 8. The Stability of Social Organisations

Social stratification is a fundamental character of our pattern of culture. It very largely determines the set of

motives that we have earlier distinguished as those of transformed aggression in the form of social competition.\* The social prestige attached to a higher position in the scale of social stratification is part of the reward of the successfully competitive individual. This system of motivation has its disadvantages, both individual and social. We have already discussed the disadvantages to the individual who suffers from failure to attain his object in the competitive system. The social disadvantages of the system is its tendency to result in social instability.

A permanently stratified social organisation may also be a stable one. Neither the economic disabilities of the lower social strata nor the low social esteem that they enjoy is in itself a cause of social instability. It is probable that an organisation in which serf labour is employed is very generally more stable than one in which there is a class of free workers receiving wages. More generally, we may say that a stratified organisation of society will attain its greatest stability if members of all strata have the attitudes and sentiments which fit them into their place in the scheme of stratification, if they have no motives driving them to try to alter their position in the system (e.g. if membership of a certain stratum is inherited and cannot be altered by the efforts of the individual) and if they are not conscious either of group membership of a depressed class or of any avoidable hardship or injustice in their economic position.

Thus the typical employee of a titled landlord feels respect for his employer without either envy or hatred. He does not wish to occupy the position of landlord himself, for such an aim is too remote from possibility to be a reasonable goal of his effort. He is not conscious of himself as a member of a class with interests opposed to those of his employer's class. Rather his group consciousness takes the form of awareness of himself as a member of the small stratified group of his employer and the other

employees on the estate. He does not feel his relative poverty as an injustice, for he considers it as an inevitable part of an established order of things whose rightness he has not been taught to question.

Very different is the typical manual worker of the city. He is likely to have little personal contact with his employer, with whom his relationship may last only for a short time. The conditions are thus not favourable for the development of sentiments towards his employer which would keep him contented with his relatively inferior position. Frequent changes of employment may make it difficult for him to become group-conscious about the firm<sup>1</sup> with which he works; whereas the fact that he lives in a locality entirely surrounded by those of his own social class and that he finds political and other organisations to strengthen his sense of class membership all tend to develop his class consciousness. In addition he may have become acquainted with a system of ideas which have suggested to him that neither his economic hardships nor his low social prestige are inevitable.\* He may have learned to feel that he is the victim of a system by which the fruits of his labour are very largely diverted to the support of members of a privileged superior class, and that this system is maintained by the determination of members of this superior class to defend their class interests. Here we have the social and psychological conditions for the development of class hatred and of social instability through class conflict.

We see in the world of politics more than one way in which an attempt is made to restore social stability by eliminating this danger of class conflict. The socialist solution of the "classless society" or (in our terminology) the "unstratified society" aims at the removal of instability by elimination of the superior-inferior relationship between

\* It is usual to treat economic conditions as the sole causes of social unrest. I think the psychological factor of the low social esteem in which manual workers are held in our culture is also a potent cause of discontent.

classes both in its economic and its psychological aspects—by aiming at effective equality of income and of social esteem for different occupational groups. Progress towards this solution is commonly held to require the intensification of class-consciousness amongst members of inferior social strata and of attitudes of hostility against other social classes so that these may provide the motive force for effecting the change from a stratified to an unstratified social organisation.

An alternative solution (that of fascism) is to aim at the restoration of the stratified social organisation to a condition of stability. We have already seen that stratified organisations can undoubtedly be stable if certain conditions are fulfilled. If the economic disabilities of the inferior strata are minimised, if class consciousness is replaced by national consciousness (*i.e.* if the manual worker of the cities can have the same sort of attitudes towards the national group and to his own place in it as we have supposed the nobleman's employee has to the estate of which he is a member), and if the system of ideas leading to discontent with stratification is stamped out, then there would seem to be no reason why a stratified social organisation should not remain stable.

Both solutions are probably practicable; both have dangers arising from the character of the forces between segregated groups. The danger in the road to a stable integrated fascist state is that intense national consciousness almost inevitably involves hostility to other national groups, and a group of mutually hostile adjacent nations could, under modern conditions of warfare, do each other sufficient damage for little of the fabric of civilisation to survive. The attainment of stability by the road of intensification of class hostility has equal danger from the possible destructiveness of a civil war between classes. If the people of the world must choose between these two alternatives, they must also try to devise methods of avoiding their dangers.

It is, of course, possible that not all of the civilised nations will be driven to make a choice between these alternatives. With a stratified pattern of culture under a democratic system of government, it is conceivable that the standard of living amongst the lowest strata may rise to a sufficient extent to make their economic grievances no longer an effective spur to revolutionary action. With a rising standard of living, their social prestige would probably also rise. Both of these factors operated in the United States of America to produce great social stability until about the year 1929. In that year, Americans believed that these conditions would last; actually they did not. Marx claimed to have proved that the economic conditions of the working classes under a capitalist system (*i.e.* an acquisitive-competitive pattern of culture) must grow worse and that social instability must increase.<sup>296</sup> His demonstration has not, however, generally been judged to be convincing.

Towards which of these possibilities—of socialism, of fascism, or of some intermediate solution of the problem of social instability—our own individual efforts shall be directed, is a matter which must be decided by our own estimate of the relative worth of the values to be attained under them. With this choice, social psychology is not directly concerned. Its function is to understand the nature of the forces underlying class conflict, and for this purpose it is necessary that they should be scientifically studied and investigated.

## CHAPTER XVIII

### THE PSYCHOLOGY OF MORALITY

#### 1. The Moral Sentiments

Everyone agrees in regarding some lines of conduct as *good* and others as *bad*, and, on the whole, social approval is bestowed on the person who carries out *good* conduct and disapproval on those whose conduct is *bad*. About the question of exactly what behaviour is good and what bad, different societies and different individuals have had different opinions; but all societies and individuals agree in the distinction itself.

We need not, for the moment discuss which particular kinds of behaviour ought to be regarded as good and which as bad; what makes conduct good or bad; or whether there are absolute and universal standards of goodness and badness. These are all questions of ethics, and a consideration of them would take us away from the path of a psychological study of morality. All that is necessary is to note as a fact that every individual feels that he *ought* to do some things and *ought not* to do others, and that when he does what he feels he ought to do he believes that he is behaving morally, and when he does what he thinks he ought not to do that he is behaving immorally. It is the sentiments which have been built round particular kinds of conduct, distinguished by the feelings of *ought* and *ought not*, that are the moral sentiments.

We mean then by *moral sentiments* the sentiments which are built round particular kinds of behaviour; the sentiments which result in approval of moral kinds of behaviour in ourselves or other people, and disapproval of immoral kinds. It is necessary to be clear about the fact that we do not mean every kind of sentiment from

which moral behaviour can spring. Care for our parents, for example, may spring from the sentiment of love for them and not from the sentiment of approval for filial behaviour. Nothing but confusion could result from applying the term moral sentiment to every sentiment which leads to behaviour of moral value, for every sentiment in some situations probably does lead to moral behaviour. If, on the other hand, we use moral sentiment in the more restricted sense, we must recognise that the moral sentiments are not the only roots of moral behaviour.\*

## 2. Social Approval and Disapproval

There is no doubt that primitively moral behaviour is behaviour of which there is social approval, and that the development of the moral sentiments in the individual results from his acceptance when he is a child of the point of view of the grown-up people who tell him that this line of conduct is good, but that is naughty. Finally he feels the same emotions of approval and disapproval towards certain lines of conduct as other people, he becomes part of the social unit which approves or disapproves.

Moral approval and disapproval, however, are only one kind of social approval and disapproval. We disapprove of a person having smallpox or a physical disfigurement, but unless he has deliberately exposed himself to infection or to disfigurement, the feeling of disapproval is a different one, and one which does not produce the reaction of shame in him. Moreover, there are particular conditions which a line of conduct must fulfil to arouse the emotions of moral approval and disapproval. We feel social disapproval of a person who has killed another only when he

\* Kant's teaching on morality amounted to the ascription of moral value only to conduct which proceeded from the moral sentiments. Against this view most men would agree with Schiller that it is better to care for our parents because we love them than because we believe it to be a virtuous course of action



has not done it accidentally or in a state of automatism. In these different attitudes towards different kinds of behaviour and different conditions of the same behaviour lies the meaning of the word *responsibility*.

Moral approval or disapproval is felt for a man's acts when he is "responsible" for them. It would probably be a more correct psychological account of this distinction if we said that what we mean by a man being *responsible* for his acts is that we morally approve or disapprove of them. The condition under which we ascribe responsibility is that the act has been carried out voluntarily by the man performing it, and with the conscious intention of attaining the end he has attained.

When we call an action "voluntary" we mean either that it is a volitional action or that, if it is an impulsive action, it could have been inhibited by volitional effort. This is essentially the criterion adopted for the legal conception of criminal responsibility. By the *McNaughten* rules (given by the Law Lords after the *McNaughten* murder of 1843, in which a defence of insanity was successfully made), a person is not held legally responsible for a crime if he was suffering from such a defect of reason, from disease of the mind, as not to know the quality of the act he was doing, or if he did know it, he did not know that the act was wrong. Thus he is not legally responsible if he lacks (through mental disease) the system of ideas necessary for making the correct volitional effort to avoid crime. There is plainly another possibility, that mental disorder may make an impulse too strong for volitional control. This is not recognised as a defence in English law (by a decision of 12 high court judges in 1924) although it is a valid defence in some states of the U.S.A.

The conditions under which responsibility is ascribed for conduct differ in different ages and different countries. Westermarck points out, for example, that in some codes of law, punishment is administered (and therefore presumably moral disapproval is felt) for an accidental killing as well as for an intentional one.<sup>267</sup> Although the line between the actions for which a man is and is not held responsible is drawn in a different position by different societies and at different times, yet its correct position always seems clear to the people of any one society at any one time. Modern psycho-pathology, however, makes us doubt the finality

of the criteria popularly accepted as limiting responsibility. It is possible, for example, that certain impulses carried out consciously and with clear intention may be genuinely uncontrollable. The opposite difficulty is raised by impulses which are carried out automatically but in response to an unconscious wish. If a person in a state of automatism commits a crime he is not held to be responsible; yet that crime, let us say murder, may be the result of an unconscious wish to kill the murdered person. Moreover, it is possible that punishment may be to some extent effective as a deterrent even from actions for which the person committing them cannot be held fully responsible.

These are difficulties in the rational justification of the ascription of responsibility and of the practical application of this idea in legal punishment. They suggest that there is no sharp line (as popularly supposed) between responsible and irresponsible behaviour, but a continuous gradation between them. But the conception of responsibility as an account of social attitudes is in no way altered by these observations. It is a fact that moral disapproval and approval are felt in connection with some courses of action and not with others.\* An increased general knowledge of psycho-pathology would probably alter the line of demarcation between the actions for which a man was held responsible, and those for which he was not. Such a change has, of course, taken place within historical times. Maniacs were at one time treated like criminals, and no doubt people felt the same kind of social disapproval of madness as they did of crime. Now we feel the same kind of disapproval of madness as we do of bodily disease. A change has taken place here in the position of the line drawn between responsibility and irresponsibility.

### 3. The Social Determination of Morality

There can be little doubt that in primitive society moral behaviour is the behaviour required by society. Similarly, in the upbringing of a child, his moral ideas are implanted by his parents or teachers who tell him that certain kinds of behaviour are wrong and others right. But the impulsion

\* Although reflection makes less clear the demarcation between actions for which approval and disapproval are felt, most people do not reflect sufficiently to cause any lack of sharpness in the outlines of social moral judgment.

to moral behaviour does not appear in consciousness as a response to social requirements. The feeling is that I *ought* to do this and *ought not* to do that; and these feelings of *ought* and *ought not* may finally conflict with actual social requirements.

A considerable amount of mystery is made by some ethical writers about the fact that the characteristic of moral behaviour is the feeling of *ought* and *ought not*, and these writers say, therefore, that it is incorrect to speak of the moral responses as having been evolved from social requirements. The way in which the moral approval and disapproval of society are felt as if the distinction had been generated in the individual's own mind is not, however, peculiar to the moral feelings, but is part of the wider phenomenon of *suggestion*. Precisely a similar transference of social requirements into apparently self-generated feelings is to be found in such things as "good form." Our reaction against wearing a white tie with a dinner jacket is felt as an autogenic requirement as clearly as are any moral requirements. We should feel shame if we did it ourselves and we feel disapproval of another person who does it. The requirement to wear a black tie with a dinner jacket is, however, recognised as a mere social convention and not as a moral requirement, because it does not appear to us to be rationally grounded when we reflect on it.

Social requirements which have no rationally justifiable end\* (which we may call *conventions*) and true moral requirements grade into each other in a continuous series, and there are lines of conduct which we would find it difficult to put into either class. Peculiarities of dress, such as we have mentioned, clearly belong to the "convention" class; while such actions as picking other people's pockets clearly belong to the moral class. But what are we to say of "trial marriages" or of appearing in public in fewer

\* That is to say, no rationally justifiable end other than that of providing uniformity within a social group.

clothes that are required by currently accepted standards of "decency"? Some people would regard these as unconventional, others as morally wrong. All of these activities would call up strong social disapproval. We are prevented from carrying out any of them primarily by our sensitiveness to the disapproval of other people. But this does not appear to introspection to be our reason for not doing them. To introspection we feel alike that we *ought not* to wear a white tie with our dinner jackets, and that we *ought not* to pick people's pockets.

We shall not discuss the ethical question of what is the sufficient reason for discriminating between the moral-immoral type of actions and other actions to which the compulsive feelings of *ought* and *ought not* are attached. Different criteria have, in fact, been used by different people. It suffices for our purpose to recognise that there is a class of actions socially disapproved which also men regard as morally wrong, whatever may be the exact grounds on which they decide that they are morally wrong.

Recognition of the social determination of moral standards does not settle the question of whether there is any absolute standard by which it is possible to judge whether activities are "really" right or wrong. Activities recognised as right by any society are those which conform to the approved behaviour patterns of its particular pattern of culture and which secure its socially approved ends. There may be rational grounds on which it is possible to say that the approved ends of some patterns of culture are better than those of others. It remains true that any such judgments will be largely determined by the standards of the particular pattern of culture in which we have been brought up.

McDougall regards the organisation of moral conduct within the self-regarding sentiment as the highest form of morality, and considers that a moral character is impossible to one lacking a strongly developed self-regarding sentiment. He says, for example, "to lose the respect of others is only the first step on

this path of disintegration of character. So long as a man still believes in himself and is capable of shame and of resenting an insult, his case is not hopeless. But, as soon as the man says 'I'm a rotter' and does not care who knows it, he is beyond the power of human aid."<sup>185</sup>

This theory seems to be altogether inadequate. No doubt, some people find their motive for moral conduct in the reduced self-esteem they would feel if they transgressed their own moral principles. The statement that this is the highest type of character, however, seems to have no better foundation than a personal preference. To many it would seem to be a highly undesirable type of character formation. The saints of Christianity and of many other religions have often regarded a destruction of the self-regarding sentiment as complete as that of McDougall's "beachcomber of the magic isles of the Pacific" as an essential step in the formation of the highest type of character.

The religious sentiment would seem to be as sound a foundation for moral conduct as the sentiment of self-regard. Men are not worse if they do what is right because they believe it pleasing to God rather than because their own right conduct increases their self esteem. There are, however, many other systems of motivation for right conduct—the moral sentiments, for example, and the system of social attitudes—which are certainly no less morally respectable than the self-regarding sentiment.

#### **4. Crime and Punishment**

Every pattern of culture has, as we have said, approved patterns of conduct for its members. Breaches of these approved patterns arouse social disapproval. Certain of the breaches are socially punished, others are checked merely by the pressure of public opinion. It is those breaches that are punished that belong to the class of "crimes."

There is no single problem of crime. The speculations of the Italian criminologist Lombroso that criminals belonged to an inferior human type with recognisable physical marks of degeneracy has now been generally

rejected as without scientific foundations. Nor is there any ground for supposing that criminals in any other way form a constitutionally different class from other people. Certainly a criminal may have a character peculiarity which differentiates him from the average person of his community even before he commits a crime; he may, for example, be a sadist who commits murder because the sight of blood flowing gives him sensual pleasure. He may, however, have a character and temperament no different from those of many non-criminals but have been led to crime because he learned burglary as a trade by the same sort of social influences as make other men teachers or policemen.

Whatever may have been the reason for a man's first steps in crime, criminal courses will in later life be likely to have become a habit system at least as difficult to change as the set of habits connected with any other occupation. Actually the difficulty is greater, since the fact that he is known to be a criminal and to have suffered a prison sentence makes it more difficult for him to obtain a non-criminal occupation. It is, therefore, much easier to reform a criminal when he is young, and the interest of the clinical psychologist is mainly centred on the juvenile delinquent.

Our first division in the class of criminals is that between those whose crimes are and those whose crimes are not the result of marked abnormality of temperament. The first we may call the class of *criminal deviants*. A man may commit crimes of violence because he is of exceptional physical strength and easily aroused anger. Or he may commit sexual offences because he has perverted sexual tendencies.

It has been pointed out that criminal deviation is a function of the pattern of culture to which an individual belongs.<sup>21</sup> A temperament which is normal in one pattern of culture may be a deviation which is dangerous to the

community in another.\* The temperamentally violent man, for example, might have been an approved character type in the middle ages, the successful business man who is the approved type of our pattern of culture would be regarded as a potential criminal in the U.S.S.R. The problem of a society with respect to its deviants is to extend social toleration as widely as possible to harmless deviations (like homosexuality), to treat dangerous abnormalities by psychotherapeutic methods in psychological clinics, and to provide harmless outlets for the energies which cannot be used in the existing pattern of culture (boxing, for example, for the violent). Possibly, preventive detention will always be necessary for some types of temperamental deviants.

More commonly the criminal has a temperament not deviating appreciably from that normal in his social surroundings. Acted on by the same incentives as other people, he may have committed an offence because his circumstances made an incentive to a crime so strong that most other people would have committed the same crime in the same circumstances. Temptations to theft are, for example, strong amongst the poor. There is a high correlation between poverty and delinquency.<sup>46</sup> In particular cases wise treatment may reduce the incentive of temptation. Thus when children steal money in order to go to the pictures, it is sometimes found that the trouble disappears if they are given a regular allowance of pocket money.<sup>46</sup> The social solution of a great part of this sort of crime would be to abolish poverty. It may not be beyond the wit of statesmen of the future to accomplish

\* A man, for example, who served with success in the war of 1914 (being decorated for bravery) was later serving a sentence of penal servitude for a crime of violence. A mutiny broke out, and he received a free pardon for his courageous defence of the warders against the mutineers. Less than a year later, he was sentenced again to a term of penal servitude for a crime of violence. His temperament made him a well adapted member of society during a time of war and of mutiny, but unfitted him for life in a peaceful society.

this. Crime would then be much reduced but it would not disappear.

The person of normal character may also be led into crime by social influences. A boy may have criminal parents. If he is to be saved from a life of crime, it is desirable that he should be removed from their influence. He may be playing with a gang of boys in the streets who, as they grow up, are being led into more dangerous illegal behaviour. This may be dealt with by removing the boy (or sometimes the leader of the gang) to another neighbourhood.

The great criminal reformer, Homer Lane, regarded the development of an attitude of hostility against authority as the principal source of juvenile delinquency.<sup>294</sup> He believed that this hostility was first aroused by parents who insisted on obedience, and that it was later transferred to the policeman and to the whole system of legal authority. His solution was to give the convicted juvenile delinquent the responsibility of sharing in the government of a free and self-governing reformatory. The inmate of the reformatory shared in the exercise of the authority which ruled it, so that it was impossible for him to be a rebel against that authority. It was found that this method was remarkably successful. Children who had been violent and rebellious became peaceful and co-operative members of Homer Lane's "Little Commonwealth"

The most commonly used method of dealing with crime is still the method of punishment. There are three possible purposes behind punishment: the *reform* of the criminal (*i.e.* his change into a law-abiding citizen), the *detering* of other people from committing the same crime by opposing the motive of avoiding punishment to whatever set of motives may be driving them to crime, and the giving of satisfaction to the feelings of the remainder of the community. This last purpose, we shall call the *vindictive* motive of punishment. It is the least respectable of the reasons for inflicting punishment but it has probably far



more force than is generally recognised. It is, in a sense, an infantile motive, on the feeling that if punishment follows crime there is a restoration of a balance that has been upset. It is felt that the criminal "ought" to suffer. This motive is reinforced by the repressed proto-sadism of infancy (and in some cases by a fully developed sadism of adult life). The strength of this motive is sometimes obscured by its rationalisation as an appeal for a deterrent punishment. There is often no conflict between this and the deterrent motive since both may be satisfied by severe and even savage punishment.† The conflict arises between both of these motives and the "reform" motive because a punishment which deters other criminals and satisfies the vindictiveness of the non-criminal may well not be the best way of reforming the actual criminal.

The satisfaction of vindictiveness should be no part of the aim of punishment. The deterrent motive cannot be so easily disposed of. No community can neglect the duty of protecting its members from crime, and deterring criminals is a necessary part of this protection. So also, however, is the reforming of criminals, and there is no doubt that in a society's treatment of criminals, reform should be the first aim. It is probable that there is a class of habitual criminals on whom reforming influence will be relatively ineffective, but a really effective use of reform would be one in which it was applied in all cases.

\* There was, for example, a letter in the local newspaper on that day on which this paragraph was written advocating flogging for members of street gangs. It ended "... Such hooligans are worse than murderers, and should be punished accordingly. They are allowed to escape with their lives; it should be only after a vigorous application of the 'cat'." This is what is meant by the "vindictive" motive for punishment. The appeal is that the gangsters "should be punished," not that such punishment would reform them or deter others.

† Although, as Bentham pointed out, certain punishment is more effective deterrent than severe punishment. Vindictiveness is often inclined to sacrifice certainty for severity.

sufficiently early to prevent the development of habitual criminals.

At the present time, it is generally (but not universally) recognised by those dealing with juvenile delinquents that the first question that must be asked is what is best for the convicted child. He may be sent to an institution (such as an industrial school) which has as its object the training of him as a law-abiding citizen. He may be remanded.<sup>46</sup> In this case he remains free with a certain amount of supervision which may make possible, if necessary, either psychotherapeutic treatment at a psychological clinic if his offence is due to a temperamental abnormality, or the changing of his social circumstances if these were leading him along the path of crime.

Homer Lane's self-governing reformatory was an attempt to get rid of a social attitude opposed to the community as a whole by making the child a part of a community in which he had community responsibilities.<sup>47</sup> It is reported that a similar experiment with adult habitual criminals is being successfully tried in the Bolshevo prison of the U.S.S.R. Although there has been no experiment so radical in our own prisons, most of the changes in prisons during the last few years have been aimed at making them more effective reforming agents (even at the cost of making prison a less successful deterrent).

The ideal of the social psychologist is, of course, that every criminal will be considered as a case for psychotherapy. Our knowledge of psychotherapy has not yet advanced to the stage at which that is possible, nor has public opinion yet developed to a point at which such treatment of criminals would be tolerated. Even now, however, much more is known about possibilities of treatment than is being socially utilised, and very much more could be found out if it were possible to make wide scientific experiments on the subject. We must hope that the time will come when the man regarded as suitable for the governorship of a prison is a trained social psychologist.

## CHAPTER XIX

### THE PSYCHOLOGY OF ECONOMIC VALUE. I.

#### 1. Desire

Desire is a feeling condition of unrest which is directed towards the attainment of an end represented in consciousness. The difference between a desire and a mere impulse is that this clear mental representation of an end is absent in an impulse. Desire differs from the emotions in the fact that it is prospective in its direction—*i.e.* its feeling refers to something which is to be attained in the future, and not to something in the present situation.

The behaviour associated with the affective state of desire is a persistent seeking reaction. When we desire something, we experience a tendency to adopt behaviour for the acquirement of that object, and this behaviour ordinarily only ceases when the desired end is attained. A behaviour tendency to attain an end may, of course, exist without any clear mental representation. Thus the organic condition of hunger and of thirst can exist and may be felt by consciousness without an actual mental representation of the food or the drink which should satisfy them. This, however, is a mere craving, and cannot properly be called desire. Desire for food or drink arises only when hunger or thirst is accompanied by the thought of the objects which will satisfy them.

The normal condition in which desire arises is that an impulse in some direction is not satisfied, because the impulse is directed to some object not immediately attainable, as a result of some external obstacle or for some other reason. When this situation causes unrest, accompanied by a more or less clear knowledge of the condition under which that unrest could be removed, we have desire.

The biological function of desire is to reinforce and to make more persistent the seeking reaction of the obstructed impulse. When we experience desire, our mental unrest (and consequently our seeking behaviour) becomes greater when the representation of the desired object recurs to our thought. We may contrast the persistence with which a man strives to attain his ends with the ease with which, let us say, his dog ceases to make efforts to attain an object, eagerly pursued at first, when that object is no longer seen by him.

## 2. Desire and Economic Value

The interest of the psychology of desire to the student of economics lies in its bearing on the production of economic values. The psychological basis of value may be described from the point of view of introspection or from that of the student of behaviour. The object of value is one which people desire, and it is one towards which they adopt the behaviour which has been described as a "positive" or a "seeking reaction."

Similarly, negative values (or what have been called "disutilities") are attributed to articles about which we tend to feel repugnance and with respect to which we adopt an avoiding reaction.

The process of exchange can be expressed very roughly by describing it as an interchange between individuals of those articles which they desire less strongly for those they desire more strongly. Demand and price are economic facts which are rooted in the psychological facts of the strength of people's desires for different articles.

The value of an article for a particular individual is measurable by the amount of effort that he is willing to make to attain the desired object, or (indirectly) by the number of other values that he is willing to give in exchange for it. Such a value of a particular object for a particular individual may be called an *individual* or a

*personal value*.\* Its varying individual values for different persons are the most elementary facts which underlie the price of an article.

While desire can be the result of the thwarting of any impulse, we are mainly interested in desires springing from behaviour tendencies which can be satisfied by the attainment of some commodity. To such tendencies we may give the name of *wants*. We must then say not that value is attached to an object when a desire for it is unsatisfied, but that when a want is unsatisfied we both attach a personal value to its object and we desire it.

This is, in fact, the sense in which the word "want" is commonly used by economists. It is important to notice that a want is not itself a psychological experience. It is only the hypothetical disposition which must be assumed to exist in an individual in order to account for the springing up of particular desires.† When a want receives immediate and unfailing satisfaction, we are not conscious

\* Or *valence* (see p. 186) There would be many advantages in replacing "value," when used in the psychological sense of a character of behavioural objects given to them by our desires, by the more purely psychological term "valence." "Value" has the disadvantage of also being used in a metaphysical sense for a presumed real property of objects which makes them proper objects for our desires.

† The same word "want" is sometimes used for the permanent tendency underlying an individual's demand for a particular commodity, and also for a transitory condition underlying his demand for it at any particular moment. I shall use the word "want" in the first only of these senses, and when it is necessary to describe the second condition, the word "craving" will be used. The fact that a person will always desire and try to obtain tobacco when his supply of it falls below a certain level is described by saying that he has a "want" for tobacco. The fact that he is looking for his pouch in order to fill his pipe is described by saying that he has, at this moment, a "craving" for tobacco. This is not quite the same thing as saying that he has a desire for it, for a desire is merely the conscious concomitant of a present craving, and a craving may not be accompanied by a conscious desire. A craving and a desire will, however, be found to accompany one another so generally that the distinction between them is very commonly neglected.

of the existence of that want at all. It is only when satisfaction is denied, so that desire arises, that we are conscious of the existence of the want. When a want is unsatisfied in this way, there springs up desire for an object which can satisfy it, and value is attached to that object. A personal value of an object and a person's desire for it are merely the same fact looked at from different points of view.

### 3. The Possibility of Quantitative Expression of Desires, Wants, etc.

The differences between the things that we discuss in psychology, economics, or in any other science, can have any one of three possible relations to the conception of quantity. They may have intensive differences which can be given an exact numerical form. People's incomes or the number of heads of cattle that they possess clearly belong to this class. There are also differences which, although they are differences of intensity, cannot be measured exactly. Two emotions of anger felt by the same person at different times, or a man's social position, belong to this group. Of two objects of this class, we may say that one is greater or less than another, but the question of how much greater is meaningless. Lastly, things may have only differences of quality which are not differences of intensity (or quantity) at all. The differences between the primary colours belong to this last class.

If we wish to think clearly and accurately on the psychology of economic behaviour it is important to keep these distinctions clearly in mind. Nothing but error and confusion of thought can result from an attempt to treat unmeasurable intensive differences as if they were measurable, or to treat differences which are not intensive at all as if they were.

First of all, we may consider the case of desires. When we make quantitative statements about desires (*i.e.* when

we use the words "greater" and "less" in comparing desires), our meaning is perfectly clear, so long as we are talking of one individual. First of all, he has differences in the intensity of his various desires which he can recognise by introspection. At a moment when he is desiring more than one thing, he can tell us by introspection alone which of these desires are strong and which are weak. Secondly, we can discover by the study of his behaviour that he uses very different amounts of effort to attain the different objects of his desires, and that at any moment he will direct his endeavours towards attaining one object of his desire rather than another.

The really important fact that makes quantitative statements about desires reasonable and useful is the observation that on the whole the introspective arrangement of his desires corresponds to the arrangement we should make by studying his varying amounts of effort and his preferences. That is to say, it is true on the whole that the things for which his desires appear to his own introspection to be the strongest are the things for the attainment of which he puts out most effort, and are the things which he will prefer to attain rather than the objects of his weaker desires.

This, it should be noticed, is true on the whole. A very little study of our own desires will convince us that there is not sufficient ground for saying that the correspondence is exact.

This means that the desires of a single individual are things between which we can make quantitative comparisons. Is it also true that we can make exact quantitative statements about desires, and say that one desire is so much greater than another, and thus put the strength of desires in exact arithmetical form? Clearly not on introspective grounds. On introspective grounds alone we can attach no meaning whatever to the statement that our desire for a certain book is, let us say, seven times as great as our desire at the same moment for a loaf of bread.

We can, however, make much more exact quantitative statements about the amount of effort we are willing to make to attain different objects of desire. What is capable of precise arithmetical expression is the *price* that we are willing to pay for the object of our desire. I may at the same time pay 8s. 6d. for a book and 6d. for a loaf of bread. Between these two there is an exact arithmetical relationship, one is seven times as great as the other.

Now it is certainly true that the reason I bought a loaf of bread was because I desired it, and similarly my desire for the book made me buy that. Can we not say that these prices are indirect measures of the strength of the two desires, and that my desire for the book was seven times as great as my desire for the loaf of bread?

The answer is that we might do this if the strength of desire for different articles were the only factor determining the price we paid for them. Quite clearly, however, it is not. Let us suppose that a man is buying a horse at a fair. The reason that he is making efforts and is willing to part with money in order to buy the horse is that he desires it. If we ask him, he will be able to give us a rough idea as to whether his desire for it is weak or whether it is strong, and, other things being equal, we can predict that if his desire is strong he will pay a bigger price for the horse than he would otherwise. But a large number of other factors will influence the price he finally pays. Such factors are, for example, the persuasiveness of the seller, the suggestibility of the buyer, the buyer's dispassionate judgment of the horse's value, and even such remote factors as the state of his health and the influence on his spirits of the weather.

But, it might be argued, we are merely enumerating different factors which influence the strength of the buyer's desire for the horse and so influence indirectly his valuation of it. The persuasiveness of the seller merely makes the buyer desire the horse more strongly, and similarly the



buyer's dispassionate judgment of how much the horse is worth increases or decreases his desire for it. In all these cases, it might be supposed that the buyer's desire alone determined the price he was willing to pay for the horse, although this desire might be dependent on many external influences. If this were the case, it would remain true that the buyer's valuation of the horse is an indirect measure of his desire for it.

This argument would be perfectly sound if, as a matter of psychological fact, it were always true that these factors only altered the price the buyer was willing to pay for the horse by altering the strength of his desire for it. Certainly they may act in this way, but it is also clear that they may not.

The persuasiveness of the seller, for example, may indeed be directed towards increasing the buyer's desire. He does this by enumerating the good points of the horse, by saying that it is a good bargain, and so on. But it is possible to influence by suggestion a course of action as well as an affective state. The seller's persuasion may take the form of a bullying assertiveness under the influence of which the buyer's desire remains unaltered while the amount of money he parts with is increased.

The more indefinite influence of the buyer's health and spirits may also affect the price he will pay directly and not through their influence on his desire for the horse. A man may, indeed, desire things less strongly because he is ill or depressed, but also he may desire something as strongly as when he is in health, but find himself less inclined to make efforts to attain the desired object.

A purely dispassionate (non-affective) judgment of the animal's value will also quite certainly be a factor in determining the price the buyer will pay. This judgment, also, may lower (or raise) the price he will pay without affecting his desire. We are none of us willing to pay high prices for things which we desire strongly if we are accustomed to pay much lower prices for them. We may desire

a cup of tea very strongly on a walk on a hot day, but if we were offered one at a wayside cottage for half a crown we should certainly refuse it.

The truth is that the buyer's desire is one factor only in the total situation determining the price he is willing to pay. If all other factors remain equal the price he will pay will vary with the strength of his desire, and we should be perfectly justified in calling the price the indirect measure of his desire. But, as we have seen, all other factors in the total situation may vary independently of the buyer's desire. We could then only make price a measure of desire if we included in "desire" the influence of every factor determining the price. This, however, is to use the word "desire" so widely that it is robbed of all useful significance, and it is a use of the word which no psychologist could tolerate.

To psychology "desire" has a perfectly definite meaning. It is an affective condition recognisable to introspection, which leads to the behaviour of seeking to acquire an object. If the word "desire" is used in this sense, strength of desire is clearly one factor and one factor only in the total situation which determines the price a buyer will pay for an article. Desire has intensive qualities, *i.e.* we can make quantitative statements about it, but it is not capable of exact measurement. It is price alone which is exactly measurable, and a price does not even indirectly measure a desire.\*

\* The error which we are here examining arises from a failure to distinguish between "desire" (the introspectible concomitant of seeking behaviour) and "craving" (the behaviour tendency itself). The intensity of desire is not exactly correlated with the strength of seeking behaviour (or valuation), craving is exactly correlated with the strength of seeking behaviour, but only because we made it so by definition. We may be thorough-going behaviourists and treat only of cravings in the psychology of demand; or we may be thorough-going introspectionists and treat only of desires. On the other hand, we may retain both the mental and the behaviour conceptions. What we must avoid is confusion between them.

When we begin to try to apply quantitative conceptions to wants we find that the matter is much less clear. We can compare the strengths of different desires, both because we notice by introspection that they appear to differ in strength, and because we observe that we are willing to use correspondingly different amounts of effort to attain the ends of different desires. We cannot make a similar comparison between different intensities of wants. It is true that different wants give rise to desires of different intensities, but the intensity of the desire springing from a want does not depend only on the nature of that want, but also on the extent to which it is unsatisfied.

An intensive term is, however, commonly used of wants when we speak of their "urgency." Wants are classified in accordance with their "urgency" into: "necessaries," "comforts" and "luxuries." This basis of classification is clearly well-founded in actual properties of different classes of wants, but we shall find it misleading in most of its implications, and our psychology of desire will probably be truer if we are very sparing in our use of the conception of the urgency of wants.

The actual property of wants which underlies this grouping of them into necessities, comforts and luxuries, is the varying strength of the desire for their different commodities when the amount an individual possesses is nothing at all. A necessary is an article (like food) for which the craving will take precedence over cravings for articles of either of the other classes if the individual possesses none of it at all. A comfort is similarly supposed to be preferred to a luxury if the individual making the choice possesses nothing of either.

The case of the individual who possesses nothing of the articles belonging to the classes under consideration, is, however, of purely theoretical interest. The classification of wants according to their urgency ceases to have any significance whatever as soon as we turn to the actual conditions under which economic demand is generated. A

person living in poverty has desires for articles belonging to the classes of comforts and of luxuries as well as for necessities, and in fact purchases them long before he has so many necessities that his desire for these vanishes altogether. If he has a small amount to spend, the particular kinds of article he spends it on will be determined by the amounts of different commodities he already has, and will not be predictable by knowledge of whether the articles in question are necessities, comforts, or luxuries. The grading of wants according to their "urgency" is, therefore, without much meaning except for the limiting case of the man who possesses nothing at all.

We cannot then say that an individual's want for one article is in general stronger or weaker than his want for another article. What we can say is that in a given situation (when he possesses given quantities of both) he will prefer one or the other. No quantitative relationships hold between wants in themselves, apart from the amount of the article in question already possessed by the individual. The classification of wants according to their urgency into necessities, comforts and luxuries tells us nothing about the strength of desire for various articles in the practically important situation in which all wants are to some extent satisfied. We cannot, therefore, in general, make quantitative statements about the hypothetical permanent psycho-physical conditions determining the occurrence of particular desires which we have called "wants," but only about those desires themselves.

The only thing in an economic transaction which is both quantitative and measurable is the price at which an exchange takes place. Much confusion arises in economic thinking by the attempt to put into the psychological conditions behind an economic transaction the properties of quantitateness and measurableness which belong only to the external transaction itself.

It is a plain fact that, other things being equal, a man will generally pay a higher price for the one of two articles

for which his desire appears to introspection to be the stronger. But it is futile to see in price the measurement of desires, for many other factors than the strength of a man's desires for different articles determine the prices he will pay for them—habit, the persuasiveness of the salesman, his respect for the social estimate of what they are "worth," and so on. Nor have we any better right to see in preferences an indication that a man expects a greater "amount of satisfaction" from one article than another. "Amounts of satisfaction," "measurement of wants," and a good deal of what is written about "consumer's rent" must be put down as psychological fiction.

Even so careful a thinker as Marshall, while he clearly recognises the immeasurability of many quantitative psychological phenomena, says: "if we find a man in doubt whether to spend a few pence on a cigar, or a cup of tea, or on riding home instead of walking home, then we may follow ordinary usage, and say that he expects from them equal pleasures" (p. 76).<sup>164</sup> If we wish our account of this doubt to be psychologically adequate, we must most certainly refuse to follow this usage.

#### 4. Individual Valuations

If we admit that wants are not expressible in quantitative terms at all, and that desire cannot be expressed in exact quantitative forms, we are faced by the problem of what use we can legitimately make of the conception of *individual valuation* (that is, of the numerical expression of a valence). Writers on economics very commonly speak of an individual valuation as some price at which a person is willing to buy or sell an article, which is perfectly definite and expressible in numerical form, before the transaction takes place. If the individual concerned is a potential buyer of an article, his individual valuation of it is the price above which he will not buy the article and below which he will buy it. If he is a seller, his valuation is the price below which he will not sell and above

which he will. An economic transaction is supposed only to take place when the valuation of the buyer of an article is higher than the valuation of the seller.

Thus the valuation is a hypothetical disposition to acquire or retain an article which is expressible in numerical form, and whose conscious concomitant is the buyer's or seller's desire for that article. Our previous discussion should render us suspicious that any such conception is largely a fiction.

As an example of the use made of this conception of the individual valuation, we may take the following account of a case of isolated exchange which is discussed by Smart: "A peasant, *B*, wishes to buy a horse, and his circumstances are such that he puts the same estimate upon £60 as he does on the possession of a horse. His neighbour, *S*, has a horse which he values as worth £20. Here there will certainly be an exchange, as, at a price, say of £40 both make a gain of £20 over the amount at which, in the worst case, they are willing to exchange. But if the exchangers act on the principle 'better a small profit than no exchange' the price may be anything above £20, or under £60, and the actual figure is determined by the 'higgling of the market.' Here, then, the price will lie between a minimum of the seller's subjective valuation and a maximum of the buyer's subjective valuation."<sup>218</sup>

The assumption underlying this passage is that there is a definite quantitative valuation in the mind both of the buyer and of the seller. In other words, it is assumed that the desire of the buyer for the horse and the desire of the seller for the horse can be expressed in an exact quantitative form. We are then left with the difficulty of accounting for the point between the valuation of the seller and the valuation of the buyer at which the exchange actually takes place.

Now it is clearly true that there is something in this conception of individual valuation, and it would be extremely difficult to give any adequate account of an

economic transaction without making use of it. In any given isolated exchange, it will be found that if the buyer could only get the article required at a very high price, he would refuse to buy it. As the price is lowered his refusal becomes less positive, until finally a point is passed at which his refusal changes to a consent, and at a still lower price he will complete the bargain with increasing alacrity.

But is this point at which he is willing to buy one which is dependent only on the previous mental dispositions of the individual concerned? If not, the conception of an exactly measurable individual valuation before the transaction takes place is untenable.

Now it is quite possible that as a result of deliberation the buyer (or seller) has determined on a definite figure above (or below) which he will not go. Examination of our own minds, however, when we buy or sell will soon convince us that such deliberate acceptance of a figure is not the normal condition under which we transact business.\* What is true is that if *B* means to buy a horse, there is (in any given set of circumstances) a definite probability that he will pay any given price for the horse.

This probability is great for low prices and small for high prices. Without doubt, there is a price so low that, under any circumstances, *B* would certainly buy the horse at that price, and another price so high that under no circumstances would he buy the horse for that amount. Between these two prices there is, for every set of circumstances, a continuous curve of decreasing probabilities from one to zero that he will buy the horse at any given intermediate price. It is clearly misleading to speak of a unique value between these two limits, and to call it his "valuation" of the horse. The buyer's valuation, like the seller's valuation, is merely a range of varying probabilities of effecting

\* It could hardly be altogether the case in the transaction under discussion, for *B* has probably not seen the horse until the time at which the bargaining takes place. This being the case, his valuation of it must be very largely formed while the bargaining is in progress.

the exchange at different prices, and the exact price at which the exchange takes place will depend on the action of all the factors which have already been mentioned as effective circumstances in the total situation.

The individual valuation of an article, then, must be defined not as a single price above which an individual will certainly not buy it and below which he certainly will, but as the whole class of prices between the lowest one at which, under any circumstances, he would refuse the article and the highest price at which, under any circumstances, he would buy it. As a result of deliberation, this class of prices may be made very small, although it is doubtful whether even the most obstinate person who has made the most careful deliberation ever reduces it to a mathematical point.

## 5. Diminishing Valuation

The different amounts of effort which a man will make in order to attain various articles (or the different prices he will pay for them) are very clearly a function of the quantity of each of the articles which he already has. A man with nineteen sacks of potatoes will make less effort to obtain a single additional one (and will pay a lower price for it) than will a man similarly circumstanced in other respects who has only one.

This is the fact of *diminishing valuation*. Every successive increment in a man's store of a commodity will in general be less highly valued by him than the last. The amount for which a man will exchange a single part of his total stock of any commodity is the *marginal value* to him of that part.\* The principle of diminishing valuation can be put in the form that as a man's stock of a commodity increases his marginal valuation of any part of it will diminish. The marginal value of a single sack of potatoes

\* It should be borne in mind that a marginal valuation is really a class of possible prices, and not a single possible price.



to a man with nineteen sacks is less than it would be if he had only two. It is clearly the marginal value to him of a sack of potatoes (and not the total value of his whole stock of potatoes) that determines the price at which he will be willing to sell and to buy a sack of potatoes.

It is necessary to distinguish clearly between the fact that with nineteen sacks of potatoes a man desires an additional sackful less than he would if he had only two, and the fact that a single sack is less serviceable to him if he already has the larger number. Both facts are true, and the first is to some extent dependent on the second. They remain, however, different facts, and the dependence is by no means complete.

The fact that the man with the larger stock of potatoes will desire an additional sack less than the man with the smaller stock is a psychological fact. This psychological fact may be called the fact of *diminishing valuation*. This diminishing valuation is in part (but not altogether) the result of an external non-psychological fact that a new sack of potatoes is less serviceable or useful to the man with the larger stock. This external fact may be called the fact of *diminishing utility*.\*

Now it is clear that so far as a man's desire for commodities is founded on a deliberate and correct estimate of their serviceableness to him, his valuation of them will vary with their utility to him. Certainly he does sometimes make such a calculation, but, equally certainly, this is not always the case. Diminished craving with diminished usefulness is to be found in behaviour on a level far below that of reflective behaviour. The full fed fowl ceases to peck at its corn, and there is every gradation of violence of effort for acquiring corn between the violence

\* This distinction is sometimes blurred by a vague use of the term "utility" for both the psychological fact of a man's desire for something and the external fact of its usefulness to him

of the hungry fowl and the indifference of the satiated one. In other words, the behaviour of the fowl shows the phenomenon described in human behaviour as diminishing valuation. The fowl's strength of effort is graded to the physiological usefulness of an additional increment of corn to it. No one, however, would suggest that this gradation takes place because the fowl has calculated the usefulness to it of successive increments of corn as it became gradually replete.

Much human gradation of effort to utility is of exactly the same kind. In human beings, of course, processes of reflective thought interpose and may be the determining factors in deciding the valuation of a new increment of a commodity. An owner of motor transport, for example, deciding whether he would benefit by having an extra motor-lorry sufficiently to compensate for the expense, does so by processes of reflection. He does not allow himself to be guided by the strength of his craving for a new motor-lorry. It is equally true, however, that the housewife's valuation of an additional  $\frac{1}{4}$ -lb. of tea per week is determined in a way much more like the purely physiological determination of the amount of corn after which the fowl stops pecking. The process involved is more complex because the demand of the housewife for tea is not determined simply by the strength of her craving for tea, but by a relationship between the strength of this craving and of her craving for the money equivalent of the tea or for the other goods which could be bought with that money. Her diminishing valuation of successive increments may, nevertheless, be as little the product of deliberate calculation as the diminishing valuation of corn by the fowl.

The use of the language of deliberate calculation for conflicts in which only cravings come into play, is an example of "the intellectualist fallacy," and must be avoided if we wish to build our economics on a psychology which is not fanciful.

There are thus two psychological conditions of demand from which the fact of diminishing valuation will follow. These are: when valuation is determined by deliberate calculation of utility and this calculation takes into account the diminishing utility of successive increments, and when the craving underlying valuation is determined by factors (physiological or psychological) which decrease in strength as more of the commodity is acquired.

Neither of these conditions may be fulfilled and then there will not be diminishing valuation. The relationship between desire for a commodity and the amount of it already possessed, is a function of the special conditions (physiological or external) under which cravings are set up. These are not only different for different cravings but different for different degrees of satisfaction of the same craving.

Let us consider, for example, the case of a man short of food. It happens to be a result of the physiological conditions of craving for food, that a small but insufficient amount of food stimulates the craving to the maximum. Persons who have carried out long fasts say that the intense desire for food disappears almost completely after the first few days. A man who is having no food at all, therefore, may be found to desire food less (and therefore to put a lower valuation on a given increment of food) than a man who is eating daily an amount insufficient to keep him alive. The curve showing the progress of the valuation of food as the amounts of it increase, will not, therefore, at its beginning show the decrease we should expect from the principle of diminishing valuation.

A differently shaped curve would be obtained for the valuation of water when the supply is insufficient, for the craving for drink has not a correspondingly low strength if the person in question has no water at all. Again, the curve for alcoholic drinks is different from that for water, and does not show the sharp decline after thirst is

quenched, which is characteristic of the curve of the desire for water.

Failure of diminishing valuation to result from diminishing utility is, in general, caused by the fact that a craving may have an element which is not graded to the actual need of the individual for the commodity craved for, and which is not altogether under the domination of his deliberate calculation. So far as this ungraded element is dominant, there will be no diminishing valuation of things as his stocks of them are increased, although there is obvious diminishing utility. The miser values his ten thousandth sovereign no less than he did his hundredth, although its utility to him may have reached vanishing point.

Probably there is a similar ungraded element in the craving for money amongst people who are not misers, although it also seems likely that this element is of very different strength in different individuals. The reluctance of a man earning £2,000 a year to spend 1s. 6d. on a taxi may be little less than that of a man earning £250 a year, although a calculation of the relative utility of 1s. 6d. to the two men would lead us to expect that the difference would be very large.

. This ungraded character of the craving for money is of considerable economic importance since it causes the acquisition of money to be a motive which may not cease to be effective as a stimulus to economic behaviour when a large amount of it has been acquired. The business man does not cease his business activity when he has gained sufficient money to satisfy the wants that he had when he started. Rather he intensifies his money-acquiring activities. The cravings for power and for social prestige may be also ungraded and, therefore, also lastingly effective economic motives.

Not, only, however (as in the cases considered above), may it happen that there are special reasons arising from the nature of a craving that prevent valuation from diminishing with successive increments although utility

does diminish; it is also sometimes true that utility itself does not decrease when the amount of a commodity already possessed becomes greater. This is plainly true, for example, in the case already discussed of a man short of food. The condition of the man with no food at all is clearly no worse than that of the man with insufficient to maintain life, so the utility of increments of food which are not sufficient to maintain life is negligible, while the utility of the increment which is just sufficient to maintain life would be inestimably great. The principle of diminishing utility will not, therefore, apply to the increments of food up to the amount just necessary to maintain life.

There is, similarly, no reason why a man acquiring a collection of old paintings should show diminishing valuation of later pictures as his collection increases. There is no external reason for a diminishing valuation of successive pictures (for the utility of a single picture bears little relationship to the number he has) and there is no obvious physiological or psychological reason why his desire for a picture should be less when he already has a large number. The collecting of Great Auk's eggs has been instanced as an example of a want in which there would be increasing and not diminishing utility, for each additional egg added to the collector's hoard would increase the unique quality of his collection.

Consideration of such cases as these has led economists to make the distinction between *satiabile* and *insatiabile* wants. Insatiability of a want may arise, as we have seen, from the special economic conditions in which successive increments are not of progressively less utility (and are therefore not diminishingly valued even if valuation corresponds to utility), but more commonly it springs from the fact that cravings do not necessarily decrease as the amount possessed of a commodity increases even though the utility of successive increments does decrease. Probably every craving has a certain ungraded element, so that its strength is in part independent of the amount of the

commodity already possessed. It should also be noticed that there is every possible intermediate stage between the graded and the ungraded craving, so that the sharpness of distinction implied by the contrast between satiable and insatiable wants is somewhat misleading.

Some writers on economic theory have thought that the principle of diminishing valuation could be deduced from Fechner's Law.<sup>65</sup> This states that the intensity of a sensation is not proportional to the strength of the stimulus producing it, but increases geometrically as the stimulus increases arithmetically. This means, for example, that if the strength of a stimulus is doubled the increment of sensation is the same as would result from increasing the stimulus from twice to four times, or from four times to eight times its original value.

If this law be taken in conjunction with the James-Lange theory that feelings are composed wholly of visceral sensations, it is maintained that the principle of diminishing valuation will follow. It should be clear that it does not. If the stimulus for a feeling of desire is a visceral change, then what follows from Fechner's Law is that successive increases of the visceral change will produce successively less and less increase in the feeling of desire. It does not follow that successively equal increments of the object wanted will cause equal or successively less increments of visceral change, which would also be a necessary premise for a deduction of the fact of diminishing valuation from Fechner's Law. That this is the case is evident from the observable fact of diminishing valuation, but we could not have predicted it merely by knowing Fechner's Law.

## CHAPTER XX

### THE PSYCHOLOGY OF ECONOMIC VALUE.—II.

#### 1. Market Values

The prices at which commodities are bought and sold in shops are obviously not arrived at by a process so simple as the interaction between the valuations of a single buyer and a single seller described in the last chapter. There are different forces, some external and some psychological, which produce the values at which common commodities are exchanged, *i.e.* their *market values*.\*

A psychological factor which is operative in determining the exchange values of commodities sold in open markets is still clearly the valuation of them by possible buyers. A commodity would not be sold at all unless a sufficient number of buyers valued it enough to make it possible for it to be placed on the market at a price which would insure a profit to the seller. Clearly, too, it is normally the marginal valuation of the buyer which determines the price he will pay for a commodity.

If I go into a shop to buy a pair of socks, the possibility of a sale taking place will depend on whether the market price of the socks falls within the class of prices which correspond with my marginal valuation of the socks.† If more is demanded for the socks than the upper limit of my marginal valuation, I shall certainly not buy them, and if it falls below the lower limit of my marginal valuation I certainly shall buy them, and for the varying prices between the upper and lower limits of my valuation there will be varying probabilities that I shall buy. Whether I shall buy or not depends (as we have already seen) on a variety of circumstances affecting my buying,

\* Or *exchange values*.

† cf. p. 371.

such as the persuasiveness of the shop assistant and the effect on me of advertisements.

The only difference between this and the more usual account of the relationship between an individual's purchases of a commodity and his marginal valuation of it is that it is here recognised that the point at which I ceased to buy is not fixed and definite (depending only on my own internal disposition to buy) but is a variable one. We cannot say that a buyer ceases to buy at a fixed point of supply at which his marginal valuation is equal to the price asked, for this point is no more fixed before the actual transaction takes place than is the price at which a buyer will buy a horse. All that we can truly say is that a purchaser of socks will cease to buy them at some point which falls within the class of prices which is his marginal valuation of a pair of socks.

The indefiniteness of the point at which a buyer will cease to buy goods is an important factor in the psychology of market valuation, for it is the psychological factor which produces the well-known phenomenon that when the supply of an article is so great that the demand for it (at a price remunerative to the manufacturer) appears to be exhausted, a further demand can be created by judicious advertising. The advertiser is controlling one of the conditions under which a buyer makes his purchases, and the effect of his operations is to make the buyer pay a price higher up in the scale of his marginal valuations, and so purchase a larger total quantity before the point is reached at which he ceases to buy.

The distinctive feature of buying such articles as socks is that there is more than one possible buyer and more than one possible seller. There is, in other words, competition between buyers and competition between sellers. What determines the lowest cost at which socks can be sold is not a psychological factor at all, but is the seller's costs of production (taking into account payment for raw materials, labour and administration, payment for use of capital, and



return on the other sales). What determines the number which can be placed on the market is the marginal valuation of the whole class of buyers. This marginal valuation will obviously decrease as the supply of socks to the market is increased, because as each buyer buys a certain number of socks, his marginal valuation for a pair of socks will decrease. Pairs of socks can, therefore, only be placed on the market in such numbers that the marginal valuation of a pair of socks by buyers will not fall below the price at which it is economically possible to sell them.\*

The fact that, as the supply of a product is increased, the price at which that commodity can be sold decreases, is expressed by the *Law of Demand*. It will thus be seen that the psychological fact of diminishing valuation by individuals is the root of the Law of Demand. With the details of how prices are fixed we shall not be concerned here, because these are treated in the science of economics

## 2. The Psychological Roots of Economic Value

A common statement of the theory of the desires leading to economic values reduces them to the needs of the moment, and the need for accumulation for future security. The matter is sometimes further simplified by treating these motives as purely egoistic. Since, however, the average man is occupied in satisfying the needs and securing the future of his wife and family as well as of himself, these motives must be regarded as derived from the reproductive system of behaviour tendencies as well as from the self-preservative system.

\* We are considering, of course, only the psychological and not the ethical aspect of demand. The fact that the price which a purchaser will pay for an article is determined mainly by the strength of his desire does not necessarily mean that this is the "just" price of that article. What has been said would remain true if we believed that the just price was determined in some other way, as, for example, by the amount of labour put into the production of the article, or if we believed that no very precise significance could be attached to the term "a just price"

We have seen, moreover, that there is good reason for supposing that there is also a tendency to accumulate wealth not limited by immediate needs or future security.\* There seems to be a specific drive to acquire and retain money and goods for their own sakes and not for any further end that they will serve.

The truth seems to be that the impulse behind economic behaviour may come from many psychological roots and not from the few which have been singled out by the theoretical economists of the past. A desire may originate from any behaviour tendency and desires from any of these origins may be productive of economic values.

The tendency to dominate over others (or "self-assertion") also originates desires resulting in economic values. The capital value of a large newspaper (which, unlike most investments, bears no simple relation to its revenue-producing capacity) arises very largely from its possibility of satisfying the self-assertive tendency.

The social behaviour tendencies, moreover, can be productive of values, and of efforts to attain those values. Members of combatant nations sacrificed their lives and sometimes even their fortunes for their respective countries, not because they performed calculations which convinced them that such conduct was to their own advantage or to the advantage of their children, but because they had formed sentiments of loyalty to their country. These sentiments gave their country's welfare a value, and produced efforts for the attainment of that welfare in which their own more private values were sacrificed.

Similarly the values of fashionable articles of clothing and of certain kinds of jewelry come from desires originating within various social behaviour tendencies such as that of primitive comradeship.† At a time when the wearing of a hat of a particular shape is fashionable amongst women, hats of this shape acquire a value through the

\* See p 376

† cf. p. 315

desires of women to be dressed in accordance with the fashion. When this particular fashion passes away, the value of the articles conforming to it is very largely lost.

Desires productive of value, however, do not arise only from those dispositions which are common to all men, but also from the dispositions acquired in the life-time of an individual (in other words, from his sentiments). The desires for water and for meat belong, for example, to the first of these two classes, while a collector's desire for old china belongs clearly to the second. Using the word "instinct" in William James's sense, we may say that the value of water and of meat comes from desires originating from an instinct, while the desire of the collector arises from his sentiment for old china.

An interesting and important group of the valuations arising from sentiments is to be found in the aesthetic and moral valuations. Such abstractions as cleanliness, beauty, order and justice may become the objects of sentiments and the instruments or institutions which promote these things thus acquire value.

A person's sentiment of hatred may also affect his individual values. When a sentiment of hatred is widespread, exchange values may be similarly affected as a result of the changes in many individual values. The exchange value, for example, of a German manufactured article in England was reduced after the war of 1914 by the unwillingness of English consumers to buy things manufactured by their enemies. But such sentiments may also increase values. The value of a knife or a revolver is increased for a person whose sentiment of hatred has led him to decide to commit murder, just as shells and high explosives acquire values for a combatant nation.\*

\* We may attempt, of course, to reduce values of this kind to the form of values for life or for security by assuming that men commit murder for such solid advantages as future security from the murdered or for present gain; and that nations engage in warfare for similar reasons. So far as these are the true

The desire which produces an economic value may also arise from a habit. No careful student of human behaviour can fail to notice how frequently desires and values are generated by habits. This is particularly noticeable amongst old people, but is in no way confined to them. Objects which have been habitually used acquire a value to the individuals who have become habituated to them, which may be much greater than an outside observer would consider to be justified by their real utility.

Although its physiological basis is complex, we have in the desire for drugs, too, a value which is mainly the result of the laws of habit. It is probable, moreover, that the economic value of most objects has in it an element which is due to habit. In order to obtain the articles to which we have become accustomed, we make efforts greater than would result from impartial calculation of their utility; and such articles, therefore, owe part of their value to desires originating from habits.

We have already seen that desires originating from a sentiment of hatred increase some values while they reduce others. A man desiring to commit murder will attach high value to a lethal weapon which would be valueless to his fellow-citizens, while his murderous desires may destroy the value for him of other objects, such as a prayer book or a concert ticket.

Similarly, desires arising from within any other system will reduce some values while enhancing others. A religious sentiment will reduce the value to its possessor of intoxicating liquors and of revolvers while it enhances his valuation of prayer books and of objects which may be used in the performance of good works.

We cannot, therefore, divide desires into the classes of those which reduce and those which increase values, for

motives for murder and warfare, the value of knives and shells may be said to originate from desires for life or for security. It will hardly be denied, however, that in both murder and warfare, hatred between men and between nations is at least as important a factor as the desire for gain or for security.

every system from which desires spring will be found to increase some values and to reduce others. We can, of course, decide that some objects which men value are better deserving of their desire than others, and we may notice that some sentiments lead to these desires, while others reduce them and lead men to value other things less worthy of valuation. This, however, is an ethical judgment with which neither economics nor psychology is concerned. The desires for whisky and revolvers are psychological facts like the desires for prayer-books and hospital stores, and the consequent values are economic facts no less in the one case than in the other.

### 3. The Psychological Inadequacy of Certain Popular Accounts of Human Behaviour

In the earliest attempts that were made to provide an account of the motives which led to the sort of human behaviour that is of interest to the economist—such as buying, selling and earning one's living—writers were often content to explain human motives by means of a very simple formula. This formula generally took the form of stating that men only acted from self-interested motives, and that all human behaviour could be reduced to a seeking for pleasure and avoidance of pain. There was sometimes a grudging recognition of impulses, such as those belonging to the sex and parental modes of behaviour, which were not self-interested. Often these too were reduced to the pain-pleasure formulation. There was rarely any recognition of socially directed impulses.

It cannot be emphasised too strongly that the objection to this kind of theory is not that it is ethically unsatisfactory, but that it is psychologically wrong. If a man were, in fact, moved by self-interested motives only, or by the desire for pleasure and repugnance from pain, it would be the duty of economists to found their psychological

theories on this fact whether or not it was repulsive to their moral sense.\*

It is odd that Marshall, when he is discussing the objections to the theory that in the choice between two actions a man will follow that course which yields him the greater pleasure, seems to consider it necessary only to deal with the moral objections to the identification of desiring a thing and desiring a pleasure which that thing will bring.<sup>184</sup> The real objection is that this confusion is a psychological error. If I hit a man because I am angry with him, that is a different thing from hitting him because I expect pleasure from the effects of the blow.

Economists are, of course, generally aware of the inadequacy of the older psychological foundations. We could hardly find a clearer recognition of the variety of the sources of human behaviour than is shown by the following extract from Marshall, in which he describes the individual to be studied in economics as: " . . . a man of flesh and blood; influenced by egoistic motives and shaping his business life to a great extent with reference to them; but not above the frailties of vanity or recklessness, and not below the delight of doing his work well for its own sake, not below the delight in sacrificing himself for the good of his family, his neighbours, or his country, and not below the love of a virtuous life for its own sake." (p. 89).<sup>184</sup>

The discussion of economic questions is not, however, confined to economists, and those who have strong views on economic problems are more influenced by writers who are neither economists nor psychologists. If we turn to the correspondence columns of our newspapers we shall find over names of weight and authority repetitions of every economic fallacy which has been founded on an over-simplified psychology. Such statements are to be

\* Many of the motives on which we are insisting (such as those derived from hatred) are, of course, no more morally respectable than self-regarding motives.

found as that "human nature never changes," that "man only acts from self-interested motives," and that ideal conditions, both of production and distribution, will follow from the play of self-interested behaviour on the part of employers, workers and consumers (if only all of these know where their own interest really lies). These statements are not only treated by these writers as indisputable, but are dignified by the name of "economic laws," which are, apparently, supposed to have the rigidity of the laws of natural science.

The true method for the discovery of economic laws (and of the psychological facts on which they rest) must be an induction from observed facts of behaviour. If, for example, observation over a large range of varied social conditions showed that capital accumulation grew progressively less as its contribution to future security diminished, and that it stopped altogether in a social system in which accumulated capital gave no security, we should have the material for a scientific induction of the psychological roots of capital accumulation. This, however, is a widely different method from the more common one of asserting that capital accumulation stops under these conditions because it obviously must do so by "economic law."

That there are certain psychological limitations within which constructive economic changes must work, no one would, of course, dispute. These limits are determined by such facts as that it is easier to change external institutions than it is to change people's mental habits, that many of the basic drives behind human behaviour tend to remain active even when they are denied their customary outlets although their activity can be diverted to new ends, and also that behaviour of a socially desirable kind (such as that involved in the production of wealth) will only take place if social conditions are adapted to give adequate motives to such activity. These, however, are psychological propositions of a totally different order from

the pseudo-psychological laws of popular economics, and hold out much more hope of beneficial constructive changes in our social system.

An example of the common assumption that in economic matters no social sentiments affect values is illustrated by a stockbrokers' circular on the loans to Germany and Russia a few years after the end of the 1914 war. After pointing out that opinions on these loans in the newspapers had been given from a national standpoint and had tried to show how far the loans would affect our national industries, this circular says:—"With this we have no quarrel. It does, however, omit the most important factor. These loans will succeed or fail as they commend themselves to the individual investor. If they offer better security and a higher yield than can be obtained elsewhere, they will be over-subscribed, and vice versa. It is useless pretending otherwise, each individual looks to his own affairs, whether he be a trader, a workman—or an investor. . . Finally, we suggest that our clients should carefully examine the proposed loans on their true merits. Neither let political bias, nor national sentiment prevent you from obtaining a good investment—if one is obtainable."

This passage illustrates very well, first, the assumption that nothing but self-interested motives will affect the subscription to the loan, and secondly, that nothing else ought to. Unless the writers of this circular had been corrupted by the kind of psychology which we are criticising, it is difficult to see how they could have made a statement so at variance with the facts as that in the first paragraph. The individual investor to the loan to Germany was undoubtedly influenced in his subscription by the extent to which he had still existing the sentiment of hate against Germany which survived from the war. The rate of interest on the loan in order to secure adequate subscription, was, in fact, greater than would have been necessary had the loan been subscribed on its economic merits alone. This is a clear case of a sentiment of a totally different kind from the sort ordinarily admitted as an economic motive having a measurable effect on an economic value.

At present, the contribution which the psychology of desire should make to economic theory is not that it should attempt to dictate to economists what in fact are the desires productive of market values. It should, however, suggest



that the economists' search for such desires should be made wider, and should include all human behaviour tendencies. Economic experience alone, however, can decide which of these sources of desire are really operative in the production of market values.

It must be admitted that the desires of multitudes of men may be very much simpler than the desires of a single individual. Many of an individual's desires will be peculiar to himself, and will be cancelled out by the opposing desires of other persons, or swamped by other people's indifference to his particular desires. As a result, the large scale demands which are operative in the production of market values might be shown by economic statistics to have a simplicity which is quite absent from the desires of a single individual.

#### 4. Social Determination of Values

While it is true that the demand for an article is determined by the inter-action of a large number of individual valuations of that article, it is also clear that a market value is not the mere resultant of a number of personal valuations each acting separately. Every personal valuation of an article affects every other personal valuation of it, and the price at which the article can command a market is in part fixed by what we may call a "social valuation."

This explains the fact that articles of little utility can often command high prices if only it is generally agreed that they ought to be bought. Bad champagne, for example, can be sold at a much higher price than a white wine of another name and of much superior quality. This is not because individual desires, independently formed as a result of individual judgments of utility, would in themselves lead the people possessing them to buy bad champagne in preference to other wines, but because there is a high social valuation of champagne.

The truth is that no human desires (except those springing from the most primitive and general impulses of hunger and thirst) do, in fact, grow up independently of the individual's social environment. Every individual desires those things that he hears other people speak of as desirable. In other words, his desires (like his opinions) are open to the influence of suggestion from the body of consumers. The demand for an article is not a mere resultant of a large number of independent desires, but is in part the product of the interaction of all these desires on each other.

Advertisers are aware of this fact when they try to induce consumers to obtain articles, not by describing their utility, but by suggesting that they are articles which other people value. This appeal may take the simplest possible form (as when an advertiser says that everybody is rushing to buy the articles he is advertising) or by the more obscure implications of such words as *chic* or *smart*, which are frequently applied to an article for the increase of its sales.

This fact that personal desires can be aroused (and that, therefore, personal valuations can be increased) by the suggestive effects of high social valuation, explain much that is otherwise puzzling in the demand for many kinds of luxury articles. If man were not a social animal it is improbable that he could be persuaded to pay 8s. 6d. for a dinner in an expensive restaurant, although the dinner is of the same quality as one which he could obtain for less than half that price at a different kind of restaurant. He does so because the patronage of such places shows him that a large number of other people value at that price a dinner eaten under those conditions, and his own valuation of the dinner is increased by the influence on him of that social valuation.

## CHAPTER XXI

### THE USE OF STATISTICAL METHODS

#### 1. Experiment in Social Psychology

The typical form of an experiment in social psychology is one which has been standardised in other branches of biological science. We may, for example, wish to test out the possibility that an intensive training in the learning of poetry would produce a general improvement of memory, such as would be shown by increased power to remember other kinds of material. We take a group of children, and begin by testing their memory, let us say by testing their power to remember nonsense syllables. Then we give them intensive training in learning poetry for an hour or two each day for a month, and retest their power of remembering nonsense syllables. This, however, is not enough. An improved performance on the second test would not prove that their training had improved their memories. There are several other possibilities. The children, for example, are now a month older and their power of remembering may simply have increased with age, or the performance of the first test may have given them practice which improved their second performance, or the experimenter himself may with practice have improved in his technique of giving the test. All or any of these factors might have produced improvement without any real effect of the training in learning poetry.

These sources of error can be avoided, however, if in addition to our *experimental* group who are to have the training in poetry, we also work with a *control* group who are also tested by means of nonsense syllables at the beginning and end of the experiment and who differ from the experimental group only in the fact that they do not

have the training in learning poetry. Evidence for the effectiveness of the training in poetry is then, not that the experimental group show an absolute improvement at the end of the experiment, but that they show an improvement relative to the control group. This use of a control group is an essential part of the technique of ensuring that the only variable condition which could have produced the effect observed is the one under investigation and that we have not been misled by the effect of an unintended variation of some other condition.

This check by a control group should never be omitted in an experiment of this kind. The most famous of recent physiologists, Pavlov, once published an account of an experiment in which he found that mice trained to run to food at the sound of a bell learned this trick very much more quickly in successive generations, suggesting the very important conclusion that learning by parents has inheritable effects facilitating learning by their offspring.<sup>180</sup> Later, however, he found that the improvement was due to a change in the experimenter's technique and not to a change in the mice, a fact which would have been at once apparent if control groups of mice whose parents had not been trained had been used throughout the experiment.

## 2. The Effects of Sampling

Whenever we try to make an empirical study in any psychological problem, we are certain to find ourselves unable to make an exhaustive study of all the cases in the world of whatever we may be enquiring into. It is necessary that we should study a limited number of cases which is called our *sample*. The larger group from which our sample is drawn and of which it is meant to be representative is called the *population*.

This sampling method, which we must always use for obvious practical reasons, has its own peculiar sources of error. Some of these can be avoided by care in selecting

our sample, others are always present and, in quantitative comparisons, their amount must be estimated by one of a number of possible statistical techniques which are not difficult and must necessarily be mastered by anyone who wishes to undertake any quantitative work in psychology or any other of the biological sciences.

From this necessity there is no escape. Those who claim to be able to make quantitative studies without the use of statistical methods will often be found to be using some method of evaluating the error of sampling which is complex and inexact, instead of the straightforward methods of the textbooks. If they are ignoring the problem of the sampling error altogether, they are in danger of drawing conclusions which are not warranted by their data or of the equally undesirable error of failing to draw conclusions which are warranted by their data. They have no way of knowing which of these things they are doing or whether they are doing either, and can have no idea of the amount of reliance to be placed upon their conclusions. Such conclusions cannot be called scientific. A working knowledge of statistical methods is a necessary part of the equipment of every scientific worker in the biological sciences.

The most obvious source of error is that there may be some process of selection in the manner of making the sample which makes it not truly representative of the population from which it is drawn. Let us suppose that we want to know the average intelligence quotient of a school and ask the headmaster to send us a sample of twenty boys. It is very likely that the headmaster will send us twenty of the brightest of his boys, and our results will be falsified because with respect to intelligence they are not representative of the population from which they were drawn. It would not have mattered if the headmaster had sent us all the boys with red hair, because this is presumably a character not correlated with intelligence and although they would not be an unselected

sample with respect to hair colour, they would with respect to intelligence. It would not have done if he had sent the boys with the cleanest faces because these might very well prove to be on an average more intelligent than the boys with dirty faces. The best way to obtain a truly random sample would be to get the headmaster to send us an alphabetical list of the boys and to select every thirtieth name.

If, however, we have succeeded in getting a random sample which is truly representative of the population from which it is drawn, our troubles are not yet over. We are still faced with the problem of the *sampling error*. In our sample of twenty boys every one will have a different intelligence quotient, and these may range from about 60 to 140 or more. By taking an average for the whole twenty boys, we certainly reduce the effect of these individual differences but we do not get rid of it entirely, since we have no reason for supposing that those above the average intelligence (of the whole school) in our sample will exactly balance those below. If we had chosen another random sample (as we might by taking the 29th, 59th, 89th, etc., boys in the list) it would have given us a somewhat different average. So the exact value of the average obtained will depend on the particular sample chosen, and this must always be the case when we draw a sample from a population of individuals differing quantitatively with respect to the character we wish to measure. There is thus, in the average obtained, a margin of uncertainty which results from these "chances of sampling." We must have some method of estimating how large this margin of uncertainty is likely to be.

We may notice that this case is not exactly parallel with that of physical measurement. If we try to determine a baby's weight by weighing it on a spring balance, we may get a series of different weighings. Here also, there will be a margin of uncertainty due to the fact that we should get a different average from different samples of these

weighings. But these differences result from "errors of measurement" due to the unreliability of the spring balance and possibly to our carelessness in reading the dial or to the fact that the baby was kicking when we read it. By improving our methods of weighing we can make these errors of measurement so small as to be negligible. This is a better way of dealing with the situation than to continue to get results vitiated by variable errors and to treat these by statistical methods. Only in very fine measurement, when we are weighing to a minute fraction of a gram or measuring length to thousandths of a millimetre are errors of measurement unavoidable even in physical measurement, so that we are led to ask the same questions about our averages as we must in the biological sciences.

In measuring the intelligence quotients of the school-boys, there are also unhappily errors of measurement, but there are also real differences not due to this cause which cannot, therefore, be eliminated by any improved method of measuring. The intelligence of one boy really is different from that of another so that if we said of any group of them: "the intelligence quotient of these boys is 102," giving no indication that this was a mere average and that individual boys differed widely from it, we should be misrepresenting the facts. We must, in addition to giving a single representative value such as the mean, give also some "measure of scatter" *i.e.*, an indication of how widely the individual values differ amongst themselves.

The most usually adopted and the most useful measure of scatter is the *standard deviation* (indicated by the Greek letter  $\sigma$ ).<sup>\*</sup> This is calculated by taking the square root

<sup>\*</sup> Galton used as his single representative value the *median* which is the middle value when all the values are written out in order.<sup>34</sup> The corresponding measure of scatter is the *semi-interquartile range*, which is half the difference between the value which lies one quarter and that which lies three quarters of the distance separating the bottom from the top value in such an order of merit.

of the mean of the squares of the amounts by which each individual value differs from the mean. If  $N$  is the total number of cases taken of the class  $x$  and we use  $\Sigma$  as a symbol indicating summation, then the average or arithmetic mean (which may be indicated by the symbol  $\bar{x}$ ) will be expressed as  $\Sigma x/N$ , and the standard deviation as  $\sqrt{\Sigma (x-\bar{x})^2/N}$ .\*

In order, therefore, to express the general tendency of a series of measurements which differ amongst themselves (such as the intelligence quotients of the above example), we must express our results not merely as a mean but as a mean and a standard deviation. We must say of our intelligence quotients, for example, that their mean was 102 and their standard deviation was (let us say) 12. This does not yet enable us to answer the question of within what limits we can regard the mean of our sample as a reliable indication of the mean of the population from which the sample was drawn. Calculation of the standard deviation does, however, take us the first step towards answering this question also.

### 3. The Standard Error of Sampling

The different averages which we should get by taking different samples from our population would themselves be distributed about a mean with a certain standard deviation from it (obviously much smaller than the standard deviation of the individuals within any particular sample). If we could know this standard deviation of the array to which our average belongs, it would obviously enable us to make some sort of prediction as to how far our particular average is likely to be from the mean of all possible samples (*i.e.*, from the true mean of the whole population). We can, without difficulty, estimate this

\* A better estimate of the standard deviation is given by the formula.  $\sigma = \sqrt{\Sigma (x - \bar{x})^2 / (N-1)}$ . Unless  $N$  is small, however, the difference will be inappreciable.<sup>76</sup>



required standard deviation of our mean by the use of a formula connecting it with the standard deviation of the individuals in our sample (itself calculated as described above). It is, in fact, this standard deviation of the individual measurements divided by the square root of the total number of individuals in the sample. The standard deviation of the mean is generally known as the standard error (S.E.). In the notation already used,  $S.E. = \sigma / \sqrt{N} = \sqrt{\sum (x - \bar{x})^2 / N}$ .

On the condition that these means will have a certain frequency distribution known as Gauss's curve of error (in practice a condition which is generally sufficiently nearly fulfilled) we can find out from tables published by statisticians,<sup>76, 184</sup> the likelihood of the mean that we have obtained differing by various multiples of the standard error from the mean of the population as a whole. There are, for example, exactly even chances that the true mean of the whole population will lie within the limits of the observed mean of our sample plus .6745 times S.E. and this observed mean minus .6745 times S.E.\* Clearly we could feel no confidence that the true mean lies within those limits. If we asserted this we should be as likely to be wrong as right. The odds are about 2 to 1 that it lies within the limits of our observed mean plus or minus the standard deviation; a likelihood still obviously too small for confident assertion. The odds are about 20 to 1 that it lies within the limits of the observed mean  $\pm 2 \times S.E.$ ; 370 to 1 that it lies within the limits of the observed mean  $\pm 3 \times S.E.$ ; and many millions to 1 that it lies within the limits of the observed mean  $\pm 5 \times S.E.$  Plainly, as we widen the limits, we can assert with greater and greater confidence that the true mean lies somewhere within these limits. No degree of likelihood, however

\* This quantity ( $.6745 \times S.E.$ ) is sometimes called the *probable error* of the mean, and similarly  $.6745 \times \sigma$  is called the probable error of the individual values. There is no advantage in calculating the probable error instead of the standard error.

great, gives us complete certainty, so we are faced with the problem of how great a likelihood is, in practice, sufficient for reasonably confident assertion. Conventionally this limit is taken as 20:1 which is the likelihood that the true mean of the whole population lies within the limits of our observed mean of the sample  $\pm$  twice its standard error. We can, of course, feel greater confidence if the likelihood is greater than this and some research workers prefer to take the limit as 50:1 ( $\pm 2 \frac{1}{3} \times \text{S.E.}$ ).

In the example already given of the intelligence quotient of a sample of 20 boys with mean 102 and standard deviation 12, the standard error will be 2.7. So we can assert with reasonable confidence that, if our sample is a random one, it is likely that the mean intelligence quotient of the whole population from which it is drawn will lie between 96 and 108, and with greater confidence that it lies between 95 and 109. Whichever criterion we use, it is clear that our measurement gives us no sufficient ground for concluding that the particular population from which the sample is drawn is really superior in intelligence to the whole school population (whose mean is 100).

It is important to notice the difference between the standard deviation and the standard error. The standard deviation is a measure of the scatter of our results. If we increase the number of cases in our sample, we should expect the standard deviation to remain about the same. The standard error, on the other hand, is a measure of the amount of uncertainty attached to our mean. It will decrease as we increase the number in our sample. Unfortunately it will decrease only proportionately to the square root of the number of cases taken, so that in order to know the mean with twice the accuracy we must take four times the number of cases.

#### 4. The Significance of a Difference between Two Means

In practice, we are less often concerned with the problem of the margin of uncertainty of a single mean than with that of the margin of uncertainty in a difference between

two means. This problem arises whenever we make a quantitative comparison between an experimental and a control group. In the example discussed earlier, we supposed that an experimental group had been trained in learning poetry, and that both it and an equivalent control group had been tested in their power of learning nonsense syllables both before and after the training period. We should then have two arrays of figures representing respectively the improvements (or deteriorations) of each of the members of the experimental group and the control group. The next step would obviously be to compare the mean change in score for each of these two groups, and if the experimental group showed a greater improvement than the control group we should feel inclined to conclude that the learning of poetry did improve memory as tested by the power of learning nonsense syllables.

We should not, however, be justified in drawing this conclusion until we had considered the likelihood that this apparent greater improvement in the experimental group may have been due to the chances of sampling. Each of these means has been calculated from an array of values which differ pretty widely amongst themselves. Each mean, therefore, has a margin of uncertainty which is due to the chances of sampling, *i.e.* to the fact that another sample of test results drawn from the same population would have included somewhat different values and would, therefore, have given a somewhat different mean. The difference between the two means must, therefore, have its own rather larger margin of uncertainty since it is vitiated by the sampling errors of both of the means compared. To find the extent of this margin of uncertainty we must know the sampling error of the difference between the means. This may readily be calculated from the sampling errors of the means themselves, since it is the square root of the sum of the squares of the sampling

errors of the two means. We can express this as an equation:  $S.E._{(M-N)} = \sqrt{S.E._M^2 + S.E._N^2}$ \*

The reasoning is then the same as before. The odds are twenty to one that the true value of the difference which we should have got in the absence of sampling errors (or from an infinite sample) lies within the limits of our observed difference plus or minus twice its standard error. The problem in practice is not usually to determine how big the difference between the experimental and the control groups is likely to be, but whether there is any real difference at all. In other words, we want to know whether our results indicate with sufficient certainty that the difference is not zero.

We must see, therefore, whether the difference we have obtained is at least twice its own standard error. If not, we cannot be confident that there really is any difference between the two groups; we are not sure that the observed difference is *significant*. If the difference does exceed this amount, we say that it is significant; the odds are more than twenty to one against the observed differences having been caused by the chances of sampling, so we can state with sufficient confidence that there is a difference between our experimental and our control groups.

The same difficulty would arise, to be dealt with in the same way, if our problem were that of determining the existence of a difference in some measurable character between two natural groups. We might, for example, wish to find out whether there was a difference in intelligence quotient between girls and boys. Since both of these groups will have individuals varying widely in intelligence, a comparison between two samples (even properly chosen random samples) would be certain to show a

\* This is the correct formula for two independent samples. It sometimes happens, however, that we are comparing two samples which are correlated (e.g., two repetitions of the same test with the same group of subjects). The standard error of the difference is then  $\sqrt{S.E._M^2 + S.E._N^2 - 2r_{MN}S.E._M S.E._N}$ , where  $r_{MN}$  is the coefficient of correlation between M and N.

difference which might be fairly large if the samples were small. Again a difference can only be regarded as sufficiently proved if it is at least twice its own standard error, and for strong conviction it should be more than this. Many altogether fallacious differences have been asserted as a result of neglect of this precaution.

Sometimes the samples compared may be two sets of test results obtained from the same individual. We may, for example, wish to know how his time of reacting to a stimulus is affected by a dose of alcohol. Reaction times obtained from the same subject under apparently identical conditions differ considerably amongst themselves, so whatever number of observations we may make under the two conditions are only samples of the individual's possible reaction times. We can draw no conclusions at all on this question unless our two samples have been large enough to make the observed difference satisfy the above criterion of significance.

It is important to notice that the above method cannot properly be used for comparing small samples. If, as is sometimes necessary, we had only four or five cases in a sample, the attempt to determine significance by the use of the standard error as calculated by this method would be altogether misleading. The standard deviation has itself an error of sampling and this would be so big in a small sample that it would be impossible to determine the standard deviation with sufficient accuracy, and hence impossible to determine the standard error of the mean. This does not mean that no valid conclusions can be drawn by comparing small samples, but simply that a different method must be used for determining significance. This is known as "Student's" method (from the pseudonym of its inventor). This, in the simplest case of determining the significance of the mean of a single set of values, consists in finding the ratio of the mean to its standard error as estimated, and comparing this quantity ( $t$ ) with the value to be expected with the required degree of probability on the hypothesis that a sample of this size has been drawn from a population of values distributed at random about zero. Thus if the sample were large,  $t$  must have the value of 2 (as we have already seen) for the odds against the zero hypothesis to be 20 to 1. If the sample were 30,

$t$  must be 2.045 to give the same degree of significance, for a sample of 20 it must be 2.09, for 10 it must be 2.26 and for a sample of 2 it must be 12.7. Tables for the use of this method will be found in Fisher's text-book, and also an account of how to use it when the problem is the comparison of two means.<sup>76</sup> This method should be used if the size of either sample is below thirty.

A calculation of significance should always be carried out when a conclusion is to be drawn from numerical data. There is no justification for drawing conclusions from differences between two samples without taking the necessary precautions against the possibility of being misled by the chances of sampling. At the same time it is necessary to be clear as to exactly what has been found out by this method of treating numerical data.

It is important to remember that we have shown only that there is a difference between the groups compared, not what it is due to. It might be due to selection in the sampling, or to carelessness in the testing (the tests might have been carried out by different persons for the two groups or at different times of the day). Even a significant difference can only be regarded as indicating the causal efficiency of the factor under investigation if adequate precautions have been taken to exclude all other causes of the difference. A careful use of statistical methods is a valuable supplement to careful experimentation, it is not a substitute for it.

By the use of the calculation of significance, we have eliminated only one source of error. A high degree of likelihood (even running to millions to one) against a result being due to errors of sampling, does not make the conclusion apparently indicated by the result equally likely. All other sources of error remain, careless experimentation and even the possibility of deliberate dishonesty on the part of the experimenter. We can very generally reduce the standard error of sampling to as small a value as we please by taking a sufficiently large sample. No further

advantage can be gained, however, by reducing it below the point at which it becomes negligibly small compared with all other sources of error in our investigation.

At first sight, it would seem scientifically more satisfactory to make the criterion of significance as severe as possible; to refuse, let us say, to draw conclusions unless the odds against the chances of sampling were more than a thousand to one. Long before this point was reached, however, the chance of being misled by sampling errors would have become negligibly small compared with other possibilities of error, so there would in general be no appreciable increase in reliability of the result. A much more serious objection to the use of a too severe criterion of significance is the fact that it would make it certain that we should often fail to draw a conclusion when a conclusion was justified; it might even mislead us into drawing a negative conclusion when a positive conclusion was really indicated.

This brings us to the last problem in the application of criteria of significance. In what circumstances can we draw a negative conclusion? Can we conclude that there is no real difference between the control group and the experimental group merely from the fact that the observed difference is less than twice its sampling error? Plainly not. The fact that the odds are 15 to 1 against a difference being due to sampling errors obviously cannot in itself be evidence that the difference is due to sampling errors. It may be necessary to draw no conclusion at all but only to note (as an indication of a problem for further research) that it is more likely than not that there is a difference which fuller investigation may demonstrate with a more satisfactory degree of likelihood.

The failure of the ratio between the difference and its standard error to reach the required value may be due to the smallness of the sample used. Unless, for practical reasons, this is impossible, we must then repeat our experiments with a larger sample. This will make the standard

error smaller. If the difference also becomes smaller so that the likelihood against it being the result of the chances of sampling remains less than about 10:1 even when the standard error has been made very small, we can reasonably conclude that there is no appreciable real difference between the two groups we are comparing.

It should be obvious that no statistical calculation can ever give us grounds for asserting with any degree of confidence that there is no difference at all between the two populations compared. This, however, is of no practical importance since we can assert with confidence that any difference that may exist is less than some assignable amount, which amount can be made as small as we please by increasing the size of our samples and so reducing the standard errors of their means. That is all that matters in practice. It is of no interest that we cannot be confident that there is no difference between the intelligence quotients of boys and girls if we can be confident that the difference, if it exists, is too small to matter.

There is a mechanical and unintelligent way of using the criterion of significance which should be avoided. An investigator compares the mean quantity or the difference he has obtained in an experiment with its own standard error. If the ratio between them comes up to the required standard, he says that his results are significant and treats them as therefore certain (often without any consideration of other sources of error in experimenting or in interpretation). If the ratio does not reach the required standard, he says the results are "not significant" and draws a negative conclusion which also (even more unreasonably) he treats as certain.

This misuse of statistical calculations may be avoided by a clear insight into their meaning. Our purpose in using them is to discover the likelihood that a difference actually obtained between measurements signifies a real difference between the objects measured. This likelihood gradually increases as the ratio between the difference and its sampling error increases. We arbitrarily choose a point at which this likelihood becomes great enough for practical purposes, but it is absurd to treat this point as if it were the point at which the likelihood changed from zero to certainty.



Another kind of situation in which essentially the same problems arise may be illustrated from a well-known enquiry into telepathy. Coover looked at a card concealed from his subject and asked the subject to guess what card it was.<sup>53</sup> The cards were drawn from a pack of 40, so the mean chance expectation was 1 right in 40. The total number of guesses was 5,135 and 153 were right against a mean chance expectation of 128.4. Was this sufficient evidence that the subjects had some capacity for guessing right? It should be clear that even if no factor but chance had been operating it would be unlikely that 128 or 129 exactly would have been guessed right, so we must again ask how big a deviation is to be judged significant.

This can be discovered as follows. If  $p$  is the chance that an event will happen and  $q$  is the chance that it will not happen, and  $N$  is the total number of trials, then the standard error of the number of times the event takes place will be  $\sqrt{Npq}$ . In this case, the standard error is, therefore,  $\sqrt{5,135 \times 1/40 \times 39/40} = 11.2$ , and the deviation of + 24.6 is more than twice its standard error. The conclusion which should have been drawn (but was not) was that the subjects were almost certainly able to guess right more often than could be accounted for by chance (whether by telepathy or by some other method) and that it was desirable to increase the number of experiments in order to put the matter beyond any reasonable doubt.

Perhaps the commonest form of this kind of problem is that in which the groups of cases to be considered are four and not two. The four groups may, for example, be successes and failures in an experimental group and successes and failures in a control group. The problem is whether the relative proportions are sufficiently different to indicate a real causal effect of the experimental conditions. For all observations of this kind (and those in which the number of classes is some other number greater than two) it is

necessary to use a method in which a quantity called  $\chi^2$  is measured.

The method is as follows. Let  $m + x$  be the number of cases actually observed in any class, and  $m$  the number expected on some hypothesis to be tested (such as the hypothesis of chance distribution). Then  $\chi^2 = \sum (x^2/m)$ , i.e.  $x^2/m$  summed for all the classes. The greater  $\chi^2$  is found to be, the greater is the significance of an observed deviation from the proportions expected. To estimate this significance we must know one other fact about the data—the number of degrees of freedom of the classes. This is the number of the classes whose amount could have varied independently (generally indicated by  $n$ ).\*

Thus an investigator discovered that 9 women showed a certain psychological character and that in 10 women it was absent, whereas 9 men had it and 4 lacked it. At first sight it looks as if this were evidence that the character in question was commoner amongst men than women since about two-thirds of the men had it and only half of the women. The validity of this conclusion must be tested by the  $\chi^2$  method. On the hypothesis that there was no real sex difference the expected numbers would be  $10\frac{1}{2}$ ,  $8\frac{1}{2}$ ,  $7\frac{1}{2}$  and  $5\frac{1}{2}$  in the four classes respectively (if the number of men and women were that of the actual experiment and the ratios of each sex who have and have not the character were the same as that actually observed for both sexes together, i.e. 9.7). The number of degrees of freedom is one (as is always the case in such a fourfold table), since only one of the observed numbers could have been independently varied without altering the totals of 19 women, 13 men—18 with the character, and 14 without.  $\chi^2$  is found by the above calculation to be about 1.5, which value (for  $n = 1$ ) it is likely to have about once in four times by the chances of sampling. The observed figures are, therefore, consistent with there being no real sex difference. In other words, the evidence for a real sex difference is quite inconclusive.

\*When the number of degrees freedom is one, a better estimate of  $\chi^2$  is obtained by applying Yates's correction for continuity, i.e. by calculating  $\chi^2$  as  $\sum \{(\bar{x} - \frac{1}{2})^2/m\}$ .

The minimum values of  $\chi^2$  for significance (using the criterion of a probability of 20 to 1 against its occurrence by the chances of sampling) are 3.84 for  $n=1$ , 5.99 for  $n=2$ , and 7.81 for  $n=3$ . If we use the more severe criterion of 50 to 1 probability, the corresponding minimum values of  $\chi^2$  are 5.41, 7.82, and 9.84. Tables for the use of this method with other values of  $n$  are to be found in Fisher's text-book,<sup>76</sup> which will be found to be the best and most practical guide for those engaged in research work in sciences in which statistical calculations are necessary.

The difference between the present cases and those previously discussed is that we are now judging conformity of our data with a hypothesis to be tested by a comparison not of scores but of numbers of individual cases. It is necessary to notice that with the present criterion, the estimate of significance depends on the absolute numbers of the cases and not merely on their relative proportions. Thus the above experimental results were published as 47.4 per cent. women and 69.3 per cent. men showing the character in question. From such figures, the conclusion might easily be drawn that it was commoner amongst men. By expressing the result in percentages, the experimenter makes it impossible for his readers to estimate the significance of his results. A similar percentage found in samples five times as big as the one taken, would, in fact, have been significant. Results of this kind must, therefore, never be expressed as percentages unless these are accompanied by a statement of the absolute numbers from which the percentages have been calculated.

## 5. Correlation

A very common type of problem in applied psychology (which has been very important in educational psychology) is whether in a group of individuals one measurable quality tends to be accompanied by another; whether,

for example, success in a school examination in Arithmetic tends to be accompanied by success in a school examination in Latin. The degree of correspondence between the scores in two such examinations may be calculated in the following way. The means and the standard deviations of the two sets of marks are determined and also the sum of the products obtained by multiplying each individual's deviation from the mean in his score for one examination by his deviation from the mean for the other examination. A deviation will be negative if the subject has less than the mean score and positive if he has more than the mean score, so that the product also may be either positive or negative. To obtain the coefficient of correlation, the sum of these products is divided by the product of the two standard deviations multiplied by the total number of subjects.\* If  $x$  stands for any subject's deviation from the mean in one test and  $y$  for his deviation from the mean in the other test, the correlation coefficients can be represented as  $r = \Sigma xy / N\sigma_1\sigma_2$ , † where  $\sigma_1$  and  $\sigma_2$  are the standard deviations for the two tests. Since  $\sigma_1 = \sqrt{\Sigma x^2 / N}$  and  $\sigma_2 = \sqrt{\Sigma y^2 / N}$ , it is obvious that the above formula

\* While this is the essential method, the separate values are not, in practice, dealt with as individuals if the total number is large. Much time is saved by grouping similar values together. This applies also to the working out of means and standard deviations. Very much time can also be saved by working from an arbitrary mean and making the necessary corrections to the final values. Limitations of space prevent the description of these time-saving devices here, but they may be learned from any text-book of statistical methods and should be used.<sup>78</sup> The time taken to master them may be considerably less than the time saved by their means in a single calculation.

† This is the Bravais-Pearson formula which is most generally used. Spearman has also devised a rank-difference formula which can be used for data in which we have no scores but can only rank our subjects in order of merit. This has also the advantage of being somewhat more easily calculated when the number of subjects is not large enough for grouping the scores. On the whole, the Bravais-Pearson formula is to be preferred when it can be used.

can be written in the practically convenient form  $r = \Sigma xy / \sqrt{\Sigma x^2 \Sigma y^2}$ .

If there is no correlation between the two scores, so that success in the one examination or test is no indication at all of probable success in the other,  $\Sigma xy$  will be approximately zero since there will be (within the limits of chance deviation) the same number of negative as of positive values of  $xy$ . The coefficient  $r$  will, therefore, also be zero. If, on the other hand, there is complete agreement between the two sets of scores  $\Sigma xy$  will have a maximum value and will in fact be equal to  $N\sigma_x\sigma_y$ , so that the coefficient will have the value  $+1$ . If success in the one examination were accompanied by an equal degree of failure in the other,  $r$  would be  $-1$ . We find in practice that nearly all of the abilities which we measure in examinations or mental tests are more or less correlated with one another, but complete correlation is, of course, rare, so the values of  $r$  actually found lie generally between 0 and  $+1$ .

A correlation coefficient has itself a sampling error which is generally regarded as measured by the quantity  $(1-r^2)/\sqrt{N}$ .<sup>\*</sup> The coefficient will only be regarded as giving a significant indication of correlation if it is at least twice this amount. Little reliance can, in any case, be placed on this method of determining the significance of a correlation coefficient calculated from less than twenty pairs of measurements although other ways of dealing with correlation coefficients from smaller groups are available.<sup>76</sup>

Other kinds of investigation require still other methods of statistical treatment for their elucidation. As an example, we may take the problem (investigated by P. E. Vernon <sup>259</sup>) of studying personality by the "matching method." Let us suppose that we are trying to find out how far character is indicated by facial expression. Instead of devising measures for separate

<sup>\*</sup> Fisher, however, gives a more precise method of estimating the significance of a correlation coefficient.<sup>76</sup>

items of character and correlating these with separate items of facial expression (a method which in fact would yield insignificant results) both character and expression are dealt with as wholes. Character sketches of a small number of people (generally from three to six) are written by those who know them intimately and a number of judges are given these character sketches and also photographs of the subjects. Their task is to match each photograph with the corresponding character sketch.

This method very often shows a much greater relationship between the two things investigated than does the method of analysing them and working out correlations, probably because, in such an operation as judging character from the face, we draw our conclusions from the face as a whole and not from any elements into which its expression can be analysed. The method is widely applicable to similar problems. To judge the significance of its results, we must know the likelihood of the observed number of correct matches occurring by chance. Methods of doing this have been worked out by Vernon.<sup>259</sup>

## 6. Partial Correlation

A significant correlation between two abilities indicates the degree to which one ability in any individual tends to be accompanied by the other. The real question of theoretical interest is, however, the causal relationships which this correlation indicates. Care is needed in order to avoid jumping to unwarrantable conclusions as to cause and effect. A physiological investigator is, for example, said to have found a fairly large negative correlation between the percentage of calcium in a man's bones and the number of aunts that he has living. The obvious conclusions that having a number of aunts causes one's bones to lose calcium or alternatively that having little calcium in the bones improves the chances of one's aunts living seem both to be sufficiently improbable to make it certain that we must look in a different direction for the causal connection. There is another possibility; if A is correlated with B, A may be the cause of B, B may be the cause of A, or both A and B may be effects of the same cause C.

This is undoubtedly the case here; the third factor which is the cause of A and B is age. As a man grows older, the calcium content of his bones increases and his aunts are more likely to have died. If a group of patients had been taken all of the same age, no correlation whatever would have been found.

Here we have a case where it is unlikely that a mistake would be made since the straightforward causal connection between A and B is an absurd one. Mistakes arise when a direct causal connection between A and B is not absurd but may, nevertheless, be erroneous. Let us suppose, for example, that we wish to find out whether there is any truth in the claim that the learning of Latin improves reasoning power. We give to all the boys in a school a test of Latin and a test of reasoning power and find a large correlation, and assert therefore that learning Latin improves reasoning—quite unjustifiably. In the first place we have failed to notice that the boys in the top classes have learned more Latin and also, having had more schooling and practice in all reasoning operations, have done better in the reasoning test. The third factor is here school standing. To eliminate the effect of this we test only boys of one class and we still find a correlation although now it is smaller. Still the obvious conclusion is not justified. The more intelligent boys have done better in the Latin test and also in the reasoning test. If we could have got a sufficiently large sample of boys of equal intelligence and of the same school standing, we should have found no correlation.

Thus two abilities A and B which would be uncorrelated in a population homogeneous with respect to a character C, may appear to be correlated with one another when tested in a population heterogeneous with respect to C, if A and B are themselves both correlated with C. If, on the other hand, A and B are correlated even in a population homogeneous with respect to C, the correlation in a population heterogeneous with respect to C will in general be affected

by the fact that either A or B is correlated with C. This effect may either be to increase or to decrease the apparent correlation of A and B. For many purposes it is necessary to know what would be the correlation between A and B if it were not affected by C.

The obvious way of determining this is to make the group tested homogeneous with respect to C (in the above examples, to have all the cases tested of the same age, school standing, and intelligence). This, however, is often impracticable since it may be impossible to get a sufficiently large sample fulfilling the required condition. The same end may then be attained by the use of a formula for eliminating the effect of partial correlations (*i.e.* the correlations of A and B with C). If  $r_{AB}$  is the observed correlation between A and B, the value  $r_{AB(C)}$  which it would have in a population homogeneous with respect to C is given by the formula:  $r_{AB(C)} = (r_{AB} - r_{AC} \cdot r_{BC}) / \sqrt{(1 - r_{AC}^2)(1 - r_{BC}^2)}$ . This is very generally called the correlation between A and B with C held constant. It should be noted, however, that this formula cannot be legitimately used without correction unless we have measurements of C which are not appreciably affected by errors of measurement.

## 7. Reliability of Test Results

If any measuring instrument is applied twice to the same unvarying quantity and gives different measurements, the instrument is said to be unreliable. Most forms of physical measurement in everyday life, if carefully carried out, are sufficiently reliable for any difficulty introduced by possible unreliability to be safely ignored. Mental tests are, however, not perfectly reliable. The test result obtained from each individual is an estimate vitiated to some extent by an error which may be great or small and which may either increase or decrease his score. These random errors will have the effect of reducing the correlation between two successive applications of the same test to the same



group of people. This effect of test unreliability may be used for the purpose of assessing the reliability of a test. If the test were perfectly reliable, and if it were certain that the ability to be measured did not vary from day to day, the correlation between two such applications of the test would be unity (as would be the correlation between two careful sets of measurements of the height of a group of persons). In fact, this *test-retest correlation* (or *self-correlation*) is always less than unity. If it were certain that the ability measured did not vary from day to day, the degree of unreliability of the test could be satisfactorily measured by the extent to which the test-retest correlation fell short of unity. Since, however, we cannot be sure that this is the case, it is better to divide the test into two equivalent parts and to score these separately for each subject tested and to use the correlation between these two scores to determine the reliability of the test.

The unreliability of tests has a further effect. If we try to determine the correlation between two test results A and B, the measured correlation is always less than it would be if the two tests had been completely reliable. This reduction of correlations is called *attenuation*.<sup>223</sup> Each array of test results as actually obtained may be regarded as derived from the array that would have been obtained from a perfectly reliable test by every separate value having been given a random error. Since these errors are random, they will always reduce the amount of agreement of the array with any correlated array of values obtained from another test, just as they will reduce the correlation with a retest by means of the same test. It is possible to estimate the amount of reduction resulting from attenuation and thus to eliminate its effects if we know the self-correlations of both tests. Spearman has suggested a formula for this purpose.<sup>223</sup> It is only necessary to use such a formula if for some reason we require to have as good an estimate as possible of the absolute value of a correlation. If we wish only to know whether two results are correlated or not, we can be content to use an attenuated coefficient, knowing that this will always under-estimate the real amount of agreement between the two sets of results.

## 8. Day-to-Day Variation of Mental Functions

The use of a test-retest correlation as a measure of test reliability (and therefore, its use as a method of eliminating the effects of attenuation) depends on the assumption that whatever is being measured has not changed quantitatively between the two testings. This assumption is very probably true for measurements of intellectual ability, but probably not for the measurement of temperamental traits. If there is day to day variation in what is to be measured, even a perfectly reliable test would not give a perfect test-retest correlation. In practice both factors may be reducing the test-retest correlation: unreliability of the test used and quantitative fluctuation of the mental function tested.

The effect of such fluctuation may be estimated in the following way.<sup>249</sup> Tests A and B, both measuring the same mental character, are applied at the same time to each of a group of subjects and are repeated together at some different time with the same subjects. If both tests are unreliable but the mental function measured by both does not vary from one time to another, the four correlations  $r_{A_1B_1}$ ,  $r_{A_2B_2}$ ,  $r_{A_1B_2}$  and  $r_{A_2B_1}$  will all (within the limits indicated by their sampling errors) be equal. If, on the other hand, the function measured is itself fluctuating so that an individual subject measured at time 1 may be different at time 2, there will be an additional cause of low correlation between the tests administered at different times which is not present for the tests given at the same time. Thus  $r_{A_1B_1}$  and  $r_{A_2B_2}$  will be greater than  $r_{A_1B_2}$  and  $r_{A_2B_1}$ .

This can be expressed in another way. Since for any individual subject a quantitative change in the function measured between the times 1 and 2 will affect his scores in both test A and test B, it follows that the difference between the two sets of scores in test A will be correlated with that between the test B scores, whereas if there were no function fluctuation these differences would be

uncorrelated. The proof of the existence of fluctuation of the mental function measured by tests A and B is that  $r_{(A_1 \cdot A_2) (B_1 \cdot B_2)}$  is significantly different from zero. This may be called the *double test-retest* criterion of function fluctuation. As an index of the amount of function fluctuation, we may use the quantity  $2r_{(A_1 \cdot A_2) (B_1 \cdot B_2)} / (r_{A_1 B_1} + r_{A_2 B_2})$ . This quantity will have values from zero to  $\pm 1$  depending on the amount of function fluctuation present.

It has been shown that the qualities (whatever they may be) measured by the June Downey will-temperament test fluctuate considerably.<sup>127</sup> Intelligence apparently does not. Perseveration apparently does. For most other measurable mental characters, the matter has not yet been determined.

## 9. Ways of studying Statistical Methods.

It has already been said that an elementary knowledge of statistical methods is an essential part of the equipment of the modern psychologist. Many students are unnecessarily discouraged by the prospect of acquiring this knowledge since they feel that they have insufficient mathematical ability. There is no reason for this discouragement. The mathematical operations that they will be required to perform will only be those familiar to the elementary school child: addition, subtraction, and occasionally multiplication, division, or the finding of a square root (for which tables can be used). The appearance of unfamiliarity is given by the use of unfamiliar symbols (such as  $\Sigma xy$ ) which are merely an easily learned system of shorthand representing familiar operations.

The obstacle to the learning of statistical methods is not the difficulty of the mathematical operations required, but the very real difficulty of getting an insight into the ways

of using these methods by merely reading about them without trying to apply them. The best way of overcoming this difficulty is to obtain by some simple experiments, actual figures which may be submitted to statistical tests. In order to understand, for example, how to investigate the significance of two means, the student may make twenty independent attempts to draw a line five cms. long, and find out whether his mean is significantly different from the mean of a similar set of estimates made by a friend. In the same way, he can obtain data for working out correlations by applying two or more similar simple tests to a number of friends. Ways of getting data for trying out the other methods described will be found without much trouble. The use of the methods will then become clearer to him than they could ever become by merely reading about them.

He need not be deterred by the fear that he has insufficient mathematical knowledge. If he can solve an easy cross-word puzzle, he will find any of the statistical methods described in this chapter at least as easy. If he begins by approaching them as an intellectual recreation, he will find them no less amusing than cross-word puzzles.

## CHAPTER XXII

### MENTAL TESTING

#### 1. Individual Psychology

Individual psychology is the study of the mental differences between individuals.\* The fact that scientific methods can be used for studying individual differences as well as for studying the uniformities of different individuals was a fairly late discovery in the history of psychology. The foundation stone of the study of individual psychology was laid by Sir Francis Galton when he began to study the differences in different persons' imagery.<sup>84</sup> Since that time, however, individual psychology has assumed an importance which, on its practical side at least, is hardly less than that of general psychology.

The instrument used for the investigation of individual differences is known as the *mental test*. A mental test differs from a research experiment in psychology by the fact that, while its material and actual method of working may be the same, it is carried out with a totally different aim. In a quantitative research experiment a number of individuals are taken, and some function is measured in order to discover what is its average value (and, possibly, how its different values are distributed). Exactly the same measurement may be carried out in a mental test, but then the average value of the function is supposed to be known, and the object of our measurement is to find out whether the individual examined displays that function in a higher or lower degree than the average individual and how much he is higher or lower.

\* This term has also been appropriated by a school of mental therapy which has developed from psycho-analysis (that of Dr Adler of Vienna)<sup>8</sup> The sense in which I am using the term "individual psychology," is, however, that usually adopted.

Thus the use of a mental test always necessitates previous experimental research on the same material. It is first necessary to know what is the normal value of a mental function before we can find out whether a particular individual has that ability to a greater or lesser degree than is normal. We must also obtain a measure of scatter for a large representative sample before we can give a satisfactory expression for the amount of a particular individual's deviation from the average. This preliminary experimental work is called *establishing a norm* for the test. It is generally the most arduous part of the work of devising a new test.

The purpose of a mental test is to measure in a given individual the amount of some mental function (such as an ability) which shows quantitative variation from one individual to another. Different things are measured in different kinds of test. The purpose of the test may be to measure some restricted mental function such as richness of mental imagery (Galton<sup>84</sup>) or mechanical ability (Cox<sup>85</sup>). It may, on the other hand, be to measure general intellectual ability or intelligence. Tests of the latter kind are called *intelligence tests*. It is particularly to be noted that intelligence tests are only one kind of mental test and it is important to distinguish between these and other kinds of mental test. One sort of mechanical puzzle, for example, may be used as a performance test of general intelligence while a different sort of mechanical puzzle (one in which the difficulty lies in the operation itself and not in the intellectual processes necessary for carrying it out) may be used as a test of a special ability—mechanical ability. Both are mental tests but only the first is an intelligence test.

Mental tests may also be *vocational tests* in which what is tested are the groups of mental functions which are of importance in a particular vocation. The earliest of these was Münsterberg's famous investigation of the capacities of different tram drivers by a test with a moving strip of

paper which was designed to involve (as nearly as was possible under laboratory conditions) the same kinds of behaviour as were necessary to avoid traffic when driving a tram. Tests similar to this are not now much used since it is found that apparently similar laboratory tasks may not provide a reliable indication of the testee's capacity for an industrial task. It is found better, in practice, either to use the industrial task itself as a test or to test separately the unitary capacities which go to make up ability in it.

The determination of the number and nature of such unitary capacities is a part of the preliminary work necessary before vocational aptitudes can be measured in the most effective and economical way. It must not be supposed that the mere fact that we can name a mental capacity and devise tests for its measurement is sufficient reason for supposing that it is a unitary mental power with which we are dealing. It is practically much more useful to measure the mental powers which appear as units than the conglomerations of mental powers which are given a single name in popular speech. In ordinary speech we say that it is "a nice day," but the "niceness" of the day is not a unit and for the purposes of science, it is necessary to measure separately the temperature, the humidity, duration of sunshine, etc. Similarly the ability to drive a tram is not likely to be a unitary capacity, but to depend on general intelligence, visual acuity, speed of reaction, etc., in degrees which must be determined by experiment. The separate measure of these capacities may be the best way of determining whether a particular individual is likely to become a good driver.

## 2. Intelligence Tests

The word *intelligence* is used in ordinary speech to describe the differences in different individuals' capacity to deal effectively with a novel situation, to learn new

subjects, and so on. Every teacher will willingly describe some of his children as more intelligent than others. This does not mean necessarily that they know more than the others, or even that they learn better (for the intelligent child may be idle), but it means that they could learn more quickly than other children and more readily solve new problems. Thus what is meant by "intelligence" is intellectual *capacity* and not intellectual *ability*, i.e. the power of acquiring intellectual skill and not the amount of skill acquired. Also it is not capacity in any particular direction but general capacity of intellect. Thus we may most correctly define intelligence as *general intellectual capacity*. Since, in practice, we must generally measure ability of some kind and infer capacity from it, the term "general ability" is very generally used as synonymous with intelligence.

The conception of intelligence began to be made precise only when Binet brought out his series of tests to be used in measuring the mental ability of school children.<sup>27</sup> Binet's tests consisted in asking children to answer questions or perform tasks, and judging their intellectual capacity by their success in a number of standardised questions of difficulty graded for different years. Thus, a child whose age was 6 years and 3 months might be found able only to perform tasks which are those successfully performed by the average child of 4 years and 2 months. This child, whose actual age was 6; 3, would then be said to have a *mental age* (M.A.) of 4; 2. The amount of his retardation as compared with a normal child is expressed by saying that he has an *intelligence quotient* (I.Q.) of 67. This is the amount obtained by dividing the mental age by the actual age, multiplying by 100 and expressing the answer by the nearest integer.

This is a convenient method of expressing a child's intelligence level because, throughout childhood, intelligence varies with age. Other methods must be adopted for expressing an individual's performance in other mental tests. We learn



## Mental Testing

thing about the individual tested if we are merely told that raw score in a test is 76. This figure depends on the difficulty of the test and on the method of marking. In order that the score may be of any use to us, we must know how it compares with the normal score and how it compares with the deviations of other individuals from that normal score. Galton introduced a method of indicating test performance which is called that of *percentile rank*.<sup>84</sup> If the test is applied to a large random sample, we can discover what would have been the score in a random sample of 100 cases, of the best individual, the second best, etc. If the test is later applied to an individual, we may find that his score is, let us say, equal to that of the nineteenth in such a sample of 100. His percentile rank is then said to be 19. This method was used, for example, by Seashore

in his tests of musical ability.<sup>212</sup> The most generally useful method, however, is to express the individual's deviation from the average in terms of the standard deviation of a large random sample as unit, i.e. as  $(S-M)/\sigma$ , (if  $S$  is the individual's score,  $M$  the mean score, and  $\sigma$  the standard deviation of the scores). This method of comparing an individual result with the norm has the disadvantage (as compared with the percentile rank method and the  $IQ$ ) of not being readily comprehensible to anyone not familiar with statistical methods

The mental age of a particular child is found to increase steadily as he grows older but more slowly as he approaches maturity. At about 16 the curve of average test performance shows no further rise with age, so that somewhere about then the increase of mental age must be supposed to stop. The individual may afterwards acquire more knowledge, more skill, and more wisdom, but his capacity for acquiring these things has reached its upper limit. Research has also shown that in middle age general intellectual capacity begins to decline, slowly at first but more rapidly as old age comes on. In order to estimate an intelligence quotient for an adult, his mental age as measured by an intelligence test is divided not by his actual age but by the age at which mental growth is supposed to stop. In most test scales, this age is taken to be 16.

While the mental age of a child increases, his intelligence quotient is found to remain approximately

constant.<sup>89</sup> It is this fact that gives the intelligence test its predictive value, since it is possible to know at a relatively early age whether a child will profit by education at a high level and whether he is likely to succeed in a profession requiring high intellectual ability. It is also possible to detect whether there is so much intellectual defect as to require institutional care or education at a special school. The constancy of the intelligence quotient is not so complete that we are entitled to say that a child's intelligence level is entirely determined by his inherited intellectual endowment, since it is certain that some illnesses (such as *encephalitis lethargica*) cause decline of the I.Q.,<sup>91</sup> and it is likely that such unfavourable conditions as early malnutrition also affect it adversely.

It has been found that, after four years in a good foster home, there is an average increase of from 5 to 10 points of I.Q. amongst children adopted from unsatisfactory homes.<sup>303</sup> This effect of environment on intelligence level has been confirmed in other researches.<sup>306,307</sup> It is, therefore, clear that intelligence level is not wholly determined by inheritance, as was at one time supposed. It has been claimed that the above results suggest that the relative importance of inheritance and environment in determining intelligence level was about 4:1.

These results are confirmed by observations on twins. A correlation of .90 has been found between the I.Q.'s of identical twins (*i.e.* of twins with identical genetical constitution) as against .70 for fraternal twins.<sup>272</sup> But identical twins reared apart showed less resemblance in I.Q. than those reared together.<sup>308</sup> Again it appears that inheritance is an important but not the sole determinant of intelligence level.

Confusion is sometimes introduced into discussions on education by the use of the word "intelligence" for both mental age and intelligence quotient. Thus one person will say that a child's intelligence increases through its school life while

another says that it remains constant. It is clear that they are using the word "intelligence" with different meanings. If the word is used without qualification, it should stand for mental age, so the first speaker's statement is to be preferred. Similarly, in statistical work, if we wish to find out how some function varies with intelligence, we should work out a correlation with mental age, not with intelligence quotient. I am using the term "intelligence level" for what is measured by the intelligence quotient. This term is certainly not free from objection but there is no generally accepted single term to cover what is meant by both "intelligence retardation" and "intelligence advancement."

We have terms in ordinary speech to indicate the differences in intellectual level measured by the I.Q. Thus we speak of one child as "backward," of another as "mentally deficient," and of another as "intellectually gifted." For scientific and legal purposes it is desirable to indicate the meanings of these terms by means of intelligence quotients. This cannot be done exactly since degrees of intellectual defect are legally defined in practical terms—by the extent to which the individual is unable to see after himself (which depends not only on his I.Q. but also on such other factors as the complexity of his environment and also his temperament). Roughly, however, we may say that those of I.Q. below about 20 are "idiots," from 20 to 50 are "inbeciles." Those from 50 to 70 are classified in the U.S.A. as "morons"; this term is not used in Great Britain although children below 70 are classified as mentally deficient and are sent to special schools. Those below 70 in I.Q. comprise about 1 per cent. of the population. Those from 70 to 90 may be described as "backward" or "dull." From 90 to 110 (comprising about 60 per cent. of the population) are of average or normal intelligence. From 110 to 120 are classified by Terman as of "superior intelligence" and those from 120 to 140 as of "very superior intelligence."<sup>234</sup> About 1 per cent. of the population have I.Q.'s of

over 130. Those of I.Q.'s of over 140 (about  $\frac{1}{4}$  per cent.) are described by Terman as "near genius" or "genius."\*

When Binet first introduced his intelligence scale it was subjected to very severe attacks from arm-chair critics. Criticism of the same order is still to be heard from those ignorant of the immense amount of empirical justification of such tests that has now accumulated. It might have been that the somewhat artificial questions of Binet's scale would prove to measure nothing but the ability of a child to pass such tests. No one (not Binet himself) could have known that this was not the case prior to investigation. Investigation, however, has proved otherwise. These and other tests of general ability have proved to be measuring the same sort of intellectual ability as is required in intellectual learning, in solving theoretical and practical problems, and in gaining insight into complicated situations. Their results are found to provide the best prediction of success in any activity requiring intellectual ability however remote from the test situation.

A high correlation has been shown to exist between the intelligence of different children as estimated by different systems of approved tests. This shows that all systems of tests are measuring the same thing. A high correlation is also found to exist between the results of intelligence tests and the estimates of intelligence as formed by teachers. This shows that intelligence tests are measuring what the teacher means by intelligence. The results of intelligence tests, moreover, agree better amongst themselves than do the estimates of different teachers. This shows that the intelligence test is a better measure of what we are trying to get than the judgment of a teacher.

### 3. Modern Mental Testing

Revised and amplified forms of Binet's mental tests have been produced since his death. The most widely used of these is the Stanford revision which was made by

\* This is certainly not the use of the word "genius" in English and it would be better to employ the term "gifted" for these people (as is the German use). So far as genius can be defined in measurable psychological quantities it would be best described as the combination of high I.Q. with some high specific capacity.

Terman.<sup>234</sup> This is probably still the most commonly used individual test of intelligence. Individual mental tests following the general lines of Binet's method but with totally different material have also been devised (such as the Herring test). There have also been more radical changes in the practice of mental testing since the time of Binet. The most important of these are: (1) the development of *group tests of intelligence*,<sup>23</sup> (2) the development of tests of intelligence using intellectual operations more dependent on intelligence than were the operations demanded by Binet's tests, (3) the development of *performance tests of intelligence*,<sup>233</sup> (4) the devising of intelligence scales for lower age groups, (5) the extension of the technique used in intelligence testing to the measurement of school achievement, and (6) attempts to use the test technique for the assessment of traits of character and temperament.

Group tests were devised to meet the need for intelligence tests which could be administered much more quickly than is possible with such individual tests as Binet's (in which at least an hour of the tester's time must be given up to obtaining an intelligence quotient for a single person). In the testing of the whole American Army in the early days of their entry into the war, it was clearly necessary to have some method by which many persons could be tested in a short time.<sup>276</sup> Tests have, therefore, been devised which can be administered to a large number of persons at one time by a single experimenter. Examples of such group tests are: the American Army Tests and the Northumberland Mental Tests.<sup>68</sup>

There are now a very large number of such group tests to choose from and for many purposes they are the best to use. For very young children (less than eight years of age), however, individual testing is advisable.

In most modern group tests it will be found that an elementary type of reasoning is demanded instead of the mechanical remembering which played so large a part in

Binet's scale. For reasons to be discussed later, such tests are more diagnostic of intelligence. Some scales depend on such operations alone.

Success in Binet's intelligence tests, and in all scales modelled on his, obviously depends largely on ability to understand and use language. This dependence is even greater in reasoning tests. This is not usually a serious objection to their use as measures of intelligence, for the requisite ability will not vary greatly from one child in normal circumstances to another, and such variations as there are will matter little, for amongst such children ability to understand and use language will be highly correlated with intelligence. There are, however, two cases in which their dependence on language is a serious limitation of the power of these tests to measure intelligence. These are: when we are testing people of other nationalities who are imperfectly familiar with the language in which the tests are carried out, and when we are testing children whose circumstances are such that they have not been able to acquire the requisite ability in the handling of words (*i.e.* when their linguistic deficiencies are not the result of deficient intelligence but of deficient opportunities). An example of the first class is the foreign immigrants into the United States; of the second, the English children who grow up on canal barges. For these cases and for the testing of deaf children, tests have been devised in which words are not used and the subject is only required to perform some task which is almost self-explanatory. These are *performance tests*.<sup>192, 4</sup> An example of one such test is the *picture-completion test* in which the subject is required to fill gaps in a picture by choosing from amongst a number of blocks on which various objects are painted, of which only one is correct in any single gap.

A complete scale of performance tests was brought out in America by Pintner and Paterson.<sup>192</sup> An improved scale was afterwards constructed in Great Britain by Collins and Drever. Both scales have been criticised on

the ground that they include too many items (such as the form boards in which wooden insets are fitted into spaces) which show low saturation with general ability. The Collins-Drever scale is an improvement on the Pintner-Paterson in this respect. Alexander has now suggested a new performance scale including only three items all showing relatively high correlations with general ability, which may prove to be the most satisfactory scale of performance tests of intelligence.<sup>4</sup>

The lowest age group in the Binet scale (and in the Stanford revision) was four. Since, however, it is necessary, in order to get a reliable measure of a child's intelligence, that the tests should be used which are intended for a year or two below his mental age, this means that they cannot be used satisfactorily for a mental age of less than six. A. Gesell and Charlotte Bühler have now obtained norms of performance for children from six months old.<sup>40</sup> Thus, when a normally developed child a year old is presented with two sticks he takes both and strikes them against each other, whereas at 6 months he takes one and waves it about. The latter response is therefore evidence of retardation if it appears in a child of twelve months. A quotient corresponding to the intelligence quotient can, therefore, be calculated for children of less than a year old. This quotient, however, has limited predictive value since responses at these earlier ages depend less on innate intellectual capacity than they do later.<sup>39</sup>

*Achievement tests* are not intelligence tests at all but are methods of trying to measure scholastic attainments by the technique of the mental test. It is clear that the intelligence quotient is not all we want to know about a child; it is also necessary to know what use he has made of his intelligence. For this, his *achievement quotient* is obtained, which is his scholastic age (as measured by an achievement test) divided by his mental age. A child with high intelligence quotient and low achievement quotient would thus be one of high innate ability who has

made little use of it (either through idleness or lack of opportunity). The achievement test measures the same thing as the examination. It differs from the examination in using the technique of mental tests—a large number of short questions, and a rigidly standardised method of administering and marking. It is claimed that these achievement tests have many advantages over the older form of the examination, although it is not usually claimed that they can replace the old examination completely.<sup>15</sup> These advantages are: speed of administering and marking (although the original construction of an achievement test is much more laborious than that of an examination), fairness to candidates by the elimination of the personal element in the examiner's assignment of marks, and their much higher reliability than that of the examination (which can be measured objectively by the correlation between two sets of marks given to the same group of candidates by different testings). The most serious objection to achievement tests is that their universal use might be expected to have very undesirable effects on teaching methods. The subordination of methods of teaching in schools to the necessity for getting the greatest possible number of children through examinations is generally recognised as one of the most serious evils of our educational system. If achievement tests were generally used, the process of "cramming" might well become the rote learning of large numbers of isolated facts, which would have even less educational value than cramming for the essay type of examination.

The testing of temperament and character is in its infancy. The June Downey "will-temperament" tests attempted to measure character traits by giving the subject tasks (mostly connected with writing) whose performance would be expected to depend on those traits. The self-correlation of the scale is, however, so low that it cannot be considered as of any practical value whatever.<sup>127</sup> Other scales depend on the subject's verbal responses either to



verbally presented situations requiring decisions or to words expressing possible objects of worry, fear, etc. The Pressey X-O test is a scale of the latter type. A form suitable for British children is available, and is generally considered to be of practical value.<sup>298</sup>

The Bernreuter *Personality Inventory* (Stanford Univ. Press) is an example of a scale in which the subject is asked to state his own habitual reactions to a number of situations (*e.g.* "Can you stand criticism without feeling hurt?" and "Do you ever give money to beggars?"). All scales of this kind in which a verbal response is given to a verbally presented situation suffer from the defect that they lack the objectivity of the ideal mental test; an intelligent subject who sees into the object of the test can arrange his responses to give a favourable impression of his character. A test which, like the June Downey, required a behaviour response to a controlled situation would be more satisfactory if a workable form of such a test could be devised. At present it is probable that the most reliable way of assessing temperamental and character traits is to take the average of a number of independent ratings by individuals who know intimately the person in question. This, however, is to abandon the test technique and is a method which has its own practical difficulties

## CHAPTER XXIII

### INTELLIGENCE AND INTELLIGENCE DIFFERENCES

#### 1. What is Intelligence ?

It is easier to show that intelligence tests are measuring something important which corresponds roughly to what we call "intelligence" in ordinary speech than it is to give a precise account of what this intelligence is. The intelligent person is one who tends to show a good performance in a large number of different intellectual tasks. This may be because there is some general factor underlying his capacity to do them all (as muscular strength is a general factor underlying one's ability to row, wrestle, box and throw weights) or, on the other hand, the capacities to perform each different mental task might be quite independent of each other so that the fact that a person showed high ability in, let us say, mathematics was no reason at all for expecting him to learn a foreign language easily. The intelligent person would then merely be the one who happened to have a high average capacity for the performance of all intellectual tasks. It is also possible that the truth might lie between these two extremes.

As an example of such an intermediate theory we may take the theory of the existence of *faculties*.\* For example, if memory and imagination were separate faculties, it would mean that persons who excelled in one kind of remembering would tend to excel in others, but would

\* A more general way of stating this intermediate position is the assertion of the existence of "group factors," i.e. factors which many performances have in common, though not all. The faculty theory is one kind of group-factor theory, but there might be found to be group-factors which did not follow the lines of the old faculties

not tend to excel in a performance demanding only imagination. On the theory of a general factor, persons tending to excel in one kind of remembering would not only tend to excel in other kinds of remembering, but also in performances of a different kind, such as those involving imagining.

Although the view that all abilities are independent of each other is *a priori* possible and was at one time contradicted by no assured facts of psychology, it need not now be considered since it is ruled out by the observation that all different abilities are positively correlated (even with age held constant). This is true even of abilities as widely different as those required for intellectual tasks and for manual ones.

This problem is not merely an academic one since on its solution depends the decision as to what type of intelligence test is to be preferred. Binet's method was to take as large a variety of tasks as possible so that an average of the child's abilities in all of these may be obtained. This is the only defensible method on the theory that intelligence is a mere average of a large number of independent abilities, and it undoubtedly will give a measure of intelligence on any theory. But on the other theories, it will not be the best method. If there were several unitary factors, or faculties, the best test would be that which made the most representative sampling of those faculties, while if there were one general ability, it would be best measured not by a wide sampling of different abilities but by the measurement only of abilities in those tasks which are most dependent on general ability.

As an example of a theory of intelligence of the "faculty" type, which regards intelligence as compounded of a few unitary factors, we may take that on which Thorndike based his tests of intelligence.<sup>239</sup> He devised tests to measure four mental capacities which he called C, A, V, and D. The resultant measure from the combination of these four sets of tests (intelligence

CAVD) was regarded as a sampling of these four unitary capacities. C (completion) was the capacity to supply words so as to make a statement true and sensible, A was the capacity to solve arithmetical problems, V (vocabulary) was the capacity to understand single words, and D (directions) the capacity to understand connected discourse (as, for example, in carrying out oral directions).

Intelligence tests devised in accordance with this plan undoubtedly do measure what is generally meant by intelligence. It is possible, however, that this is not because intelligence is a resultant of these separate factors but because all four of the capacities depend on the amount of the testee's general intellectual capacity. This is Spearman's theory.

## 2. The Two-Factor Theory

It has been claimed by Spearman that these possible explanations of intelligence can be put to the test of mathematical proof.<sup>222</sup> The conclusion he has drawn from his results is that the existence of a general factor underlying different performances is clearly proved, and that the existence of faculties is as clearly disproved.\*

Spearman's method of proving the existence of a general factor was essentially as follows. A large number of children were tested in different performances (*e.g.* in ordinary school subjects). Every child tested was given marks indicating the excellence of his performance in each test. A correlation between different individuals' performances in every pair of tests was obtained.

\* Spearman maintains that there is a general factor underlying different abilities but does not consider that this is quite identical with "intelligence" as ordinarily understood. He says: "the popular 'General Intelligence' is being resolved into two parts: the one is, indeed, a deep underlying truth, the General Factor; but the other is a superposed mass of obscurity and error."<sup>223</sup>

These correlations were put down in tables, of which the following is one:

	Class.	French	Eng.	Math.	Dis.	Music
Classics	—	.83	.78	.70	.66	.63
French	.83	—	.67	.67	.65	.57
English	.78	.67	—	.64	.54	.51
Mathematics	.70	.67	.64	—	.45	.51
Discrimination	.66	.65	.54	.45	—	.40
Music	.63	.57	.51	.51	.40	—

The fact of a positive correlation between any two performances is evidence that there is a common factor in both. The question at issue is whether this common factor is the same for all performances (*i.e.* whether it is a *general factor*) or whether there are group factors common to a few tests but not to all. Spearman pointed out that this difference would result in a difference in the distribution of the correlation coefficients in such a table. If the intercorrelations were mainly due to the dependence of particular abilities on a few faculties, then there would be groups of high intercorrelations between such abilities as depended on the same faculty while other intercorrelations would be relatively low. A faculty for learning languages, for example, would produce a block of high correlations in the upper left hand quarter of the above table.

If, on the other hand, all abilities were dependent in different degrees on the same general factor, those abilities which were most dependent on (or most highly "saturated" with) that general factor would tend to correlate most highly with all other abilities and would be correlated with them more or less highly according to whether they were themselves much or little saturated with the same general factor. Any table of correlations between tests could then be arranged in what Spearman calls "hierarchical order," *i.e.* so that every correlation is

greater than any to the right of it in the same row or below it in the same column.

In order to determine whether a table of correlation coefficient shows hierarchical order, the following criterion is used. If a, b, c and d are any four tests in the table, hierarchical order is shown by  $r_{ab} \cdot r_{cd} - r_{ac} \cdot r_{bd}$  being zero.<sup>225</sup> The above quantity is known as the *tetrad difference*. If the tetrad difference obtained from any four tests is (within the limits indicated by its sampling error) equal to zero, Spearman maintains that this proves that the ability measured by each test is composed of two parts, one a factor common to all the tests (the general factor or G), the other a factor different for each test (its specific factor or s). He calls this theory, therefore, the *two-factor theory*.

Spearman himself carried out investigations both with school subjects and with laboratory tests (such as tests for ability to discriminate pitches, weights, etc.) and found that unless the measured abilities closely resemble each other, their correlations fall into hierarchical order (or, when taken in groups of four, they fulfil the tetrad criterion). He concludes that the two-factor explanation of dissimilar abilities is proved.

Spearman\* has explained the difference between the general factor and specific factors in ability by means of an analogy in which the general factor is compared to

\* Spearman does not deny the existence of "group factors." It is clear, for example, that a high correlation between performance in Greek grammar and Greek translation, would be in part a result of the fact that the material of each is Greek. A high correlation is similarly found between tests in which a subject is asked to cross out all the e's in a piece of prose, and a test in which he crosses out all the a's, the n's, the o's and the s's. These are performances which will have underlying group factors, because they closely resemble one another. For the demonstration of the existence of general intelligence by the falling of correlation coefficients into hierarchical order, Spearman pools the result of such very similar tests (i.e. he treats them as a single test).

mental energy and the specific factors to engines activated by this energy. Any such analogy may help understanding but should, nevertheless, be treated with caution. It should be clear that this is an entirely different use of the conception of mental energy from that discussed in an earlier chapter.\*

A person's ability in a given direction will thus depend both on the amount of his general ability and also on the amount of his specific ability in that direction. A high specific ability may be accompanied by low general ability as in musical imbeciles or in calculating prodigies of low intelligence. Different kinds of ability depend to different extents on general ability (*i.e.* are more or less saturated with G). The abilities most saturated with G are the eductive mental operations (as distinct from the reproductive ones) such as the detection of a relation or the finding of the fourth term in an analogy such as *King: Queen:: Duke: . . . . ?* (the "eduction of a correlate"). Indeed Spearman has shown (contrary to common opinion) that pure reproduction or mechanical memory shows no dependence on G at all. Mechanical remembering tests are, therefore, worthless as measures of intelligence while the best intelligence test is one that consists entirely of eductive mental tasks.

### 3. Criticism of Two-Factor Theory

The most persistent critic of Spearman's theory of general ability has been G. H. Thomson. He maintains that the facts can be explained on a theory of overlapping group factors, *i.e.* that an ability W might be composed of factors A, B, C; ability X of factors A, B, D; ability Y of factors A, C, D; and ability Z of factors B, C, D. Thus the abilities might have no common factor and any system of tests designed to measure a common factor would

only be testing a sample of the overlapping group factors. Thomson calls his theory a "Sampling Theory" of ability and would substitute for Spearman's "energy" and "engines" the explanation that the mind is composed of innumerable "bonds."<sup>237</sup>

The most recent statement of his case against Spearman's theory may be summed up as three items.<sup>237</sup> (1) A set of correlation coefficients which can be analysed into a general factor and specific factor (*i.e.* one which shows hierarchical order) can also be analysed in various other ways into systems with overlapping group factors some of which systems contain no general factor. (2) While overlapping factors will not in general cause complete hierarchical order, there is a strong tendency for them to do so if the number of factors is large. (3) The completeness of hierarchical order actually observed in correlation coefficients between dissimilar mental tests is not due to the presence of a general factor but to the fact that investigators of the theory have selected from amongst their tests, rejecting as not sufficiently dissimilar those that broke the hierarchy.

The first point we must notice about this criticism is that item (1), although certainly true, would not in itself be an adequate reason for regarding the two-factor theory as unproved.<sup>247</sup> We could still regard it as sufficient evidence for the truth of this theory that correlation coefficients always conspired to be consistent with the two-factor theory although there was no reason why they should do so on an overlapping group factor theory. In combination with the other two items the criticism is more serious. Certainly supporters of the two-factor theory have sometimes rejected tests which broke the hierarchy on the ground that they must therefore have been too similar to other tests in the series. So far as investigators have done this, the value of their evidence for the two-factor theory has been seriously reduced. The crux of the problem is to decide whether, where really dissimilar tests have been used without any other principle of selection, the correlation coefficients have fallen sufficiently nearly into hierarchical order to point definitely to the two-factor theory as the explanation of the composition of abilities. Dogmatism on this subject is not justified but the weight of opinion amongst educational psychologists is heavily on the side of the belief that they have done so, and, therefore, that the balance of evidence is on the side of the two-factor theory.



Whichever theory we choose to adopt, it will not make any real difference to our practice in intelligence testing. Thomson's overlapping group factors (unlike the group factors of theories of the "faculty" type) behave so much like a general factor and specific factors that tests devised to test such a general factor would also be satisfactory for sampling the largest possible number of bonds. If, of course, they behaved exactly like a group factor and specific factors, the two theories would be pragmatically identical, and it would make no difference whatever to our practice if we adopted the one statement or the other.

#### 4. Group Factors

The two-factor theory states that an individual's ability to perform dissimilar intellectual operations depends on the amount he possesses of a general ability common to both operations and on the amount of his specific ability peculiar to each operation. It does not deny that there are similar intellectual operations dependent on some factor common to themselves but not to all other intellectual operations. Such factors are called *group factors*.

Let us suppose, for example, that all remembering operations are carried out either well or badly by any particular individual, so that by knowing how well he could remember in one situation we would predict how well he could perform some other task of remembering. Let us suppose, moreover, that this prediction could only be made from some other memory task and not equally well from any different kind of intellectual ability (so that we could meaningfully say that he had a good or bad memory and not merely that he was more or less intelligent). Then memory would be a group factor. This is found, in fact, not to be the case, and we can say in general that such group factors as have been found are not the "faculties" of traditional psychology.

One of the earliest group factors to be distinguished was "perseveration" (p) or the tendency of any mental operation to be continued and to be replaced only with difficulty by a new operation.<sup>275</sup> This tendency had earlier been called "the secondary function." Neither very high nor very low perseveration is a desirable mental characteristic.<sup>191</sup> The high perseverator shows great mental inertia; the low perseverator is distinguished by absence of capacity for sustained activity. Tests of perseveration have been devised but are somewhat difficult to apply. It is very probable that one of the difficulties in measuring perseveration is that its amount in any individual is different from day to day.<sup>240</sup>

Cox has shown that there is a group factor of mechanical ability (m) and has devised a series of tests for its measurement.<sup>55</sup> Stephenson has shown that verbal tests have a group factor (v) so that they cannot be regarded as perfect measures of general intelligence.<sup>229</sup> This difficulty cannot be got over by substituting performance tests. These are inferior to verbal tests because they are of much lower reliability. It has been shown too that they have a common factor (I') other than general ability, so they have no advantage over verbal tests in that respect.<sup>4</sup>

At present, investigators are exploring the possibility of using for the measurement of general ability (G), perceptual tests in which the testees are asked to perform some intellectual task in connection with such material as diagrams for which neither verbal operations nor manipulations are required. It has been found that some at least of these have also a group factor which it is suggested may have something to do with the capacity for visual imagery.<sup>70</sup> Unless a sufficient variety of perceptual tests turn out to be reliable, highly saturated with G, and without a group factor, it may be impossible to devise any system of tests which will measure G alone, although, by suitable weighting, a combination of tests may be devised which is as highly saturated with G as possible. Such a combination would, in practice, do all that we require of a scale of intelligence tests, and would do it better than any existing scale, although not, of course, with theoretical perfection.

The problem of group factors is not important only in the analysis of abilities; it is also desirable to know what are the unitary factors in temperament and character. Burt has suggested that one such factor is total "affectivity," i.e., strength of emotional responses,<sup>46</sup> and one of the measurements made by

the Pressey X—O tests is that of total affectivity. There has not yet been any adequate experimental verification of the existence of this factor. Webb has distinguished a character factor which he calls *w* which is generally indicative of desirable qualities of character.<sup>226</sup> The demonstration of this factor depends on the analysis of character ratings and not of tests, and although its existence is generally admitted, it cannot be regarded as certain. No satisfactory tests have yet been devised for its measurement.

The evidence for the presence of a group factor by the use of Spearman's tetrad criterion is that  $r_{AB} r_{CD} - r_{AC} r_{BD}$  is significantly different from zero.\* If this quantity is positive it follows that either A and B or else C and D have a factor in common which is not also common to the other pair of tests. If, for example, A and B were two tests of mechanical ability and C and D were two tests of intelligence or two pools of tests known to have nothing in common except the general factor, then, if the tetrad difference were positive, we should be justified in concluding that the group factor belonged to A and B.

### 5. Multiple Factor Analysis

The tetrad difference criterion can be applied to a whole table of correlation coefficients in order to discover which (if any) of the tests have group factors in common. This, in fact, has been in the past the method adopted for the determination of the presence of group factors. It has, however, two disadvantages. First, it is very laborious. A table of 12 tests will have 121 intercorrelations, which will produce 1,485 tetrad equations. If the number of tests is 20, the number of tetrads would be over 14,000, the calculation of which would take many weeks. Secondly, the method is not well adapted to the finding of more than one group factor which may be present in the same battery of tests.

\* Various ways of calculating the standard error of the tetrad difference are given in Spearman's *The Abilities of Man*.

It will be remembered that in Spearman's own earliest description of the effect of group factors on a table of correlation coefficients, he mentioned a property of the table as a whole—the tendency of blocks of high correlation coefficients to be formed.<sup>222</sup> *Multiple factor analysis* is a method of determining the number of factors present by treating the set of correlation coefficients as a whole. More than one method of multiple factor analysis has been devised; such, for example, as the "centroid" method of Thurstone, for the details of which, Thurstone's own book must be consulted.<sup>250</sup> The essence of the method is to treat the table of correlation coefficients as a matrix. The general proposition is that the smallest number of linearly independent factors necessary to account for the correlations is equal to the rank of the matrix (*i.e.* to the highest order of non-vanishing minors).

Thurstone gives methods by which this number and also the saturation of each test with each of the factors can be found. He points out that the particular case of hierarchical order is that in which all the second order minors of the matrix of correlation coefficients (*i.e.* the tetrad differences) vanish, so all correlations are due to one common factor. Thus the tetrad difference criterion can be regarded as a special case of multiple factor analysis. A variety of methods is now available for determining the factors descriptive of the characteristics of a table of correlation coefficients, which may have been obtained from tests of ability or of qualities of character. A valuable theoretical and practical guide to these methods has now been written by Professor Burt.<sup>304</sup>

It must be remembered that multiple factor analysis (like the use of the tetrad difference criterion) does not give us any information as to the psychological nature of the factors isolated. Any such method can merely tell us what tests have common factors. It is only by inspection of the psychological nature of a group of tests having a common factor that we can infer the psychological nature

of the factor. Thus factorial analysis may tell us that a particular set of tests have a group factor in common. Inspection of these tests shows us that the kind of task they have in common (which also turns out to be absent from other tests shown not to have the group factor) is the successful manipulation of some piece of mechanism. We therefore call this group factor "the mechanical factor." The likelihood of our diagnosis being correct is increased as we widen the scope of our enquiry and find more and more performances involving mechanical manipulation showing this factor and performances not involving mechanical manipulation showing absence of the factor.

At the present time, the existence of factors has often been demonstrated much more clearly than has their psychological nature. Such results can only be regarded as indications of the presence of psychological problems to be solved in the future and not as solutions of them. If investigators are content to stop at that stage, factor analysis becomes a mathematical diversion with little psychological significance.

W. Stephenson has used factor analysis for the solution of a different type of problem in what he calls "the inverted factor technique."<sup>230</sup> Tests are used in which the subjects are asked to arrange material (let us say, a large number of pictures in order of æsthetic preference). Correlations are worked out between the arrangements made by different subjects for any one test. Thus correlations are between the subjects and not (as in the ordinary factor method) between the tests. These correlations may be placed in a table and submitted to factor analysis as above. The factors emerging have a totally different significance from those obtained above. Thus a general factor indicates a general tendency of all subjects to put the material in the same order. High saturation of an individual with this general factor shows his high conventionality of preference. A group factor found in some subjects indicates that they show the same type of preference. It is too early to predict the importance of this method but there seems reason to hope that it may be of value in putting the classification of individuals into "psychological types" on a scientific basis.

## 6. Practical Implications of the Results of Intelligence Testing

The essential discoveries from research on intelligence testing may be summed up as follows:

(1) *By the use of various forms of test it is possible to obtain a reliable indication of the general intellectual capacity of an individual child which is independent of the test used and of the individual performing the test.*

(2) *If the mental age so obtained is divided by the child's actual age we obtain a ratio whose amount is mainly determined by the inherited intellectual endowment of the child, which remains generally constant throughout the child's development, and which is the best single indication of his educability and of his probable later success.*

(3) *The individual's general intellectual capacity (i.e. mental age) increases through the period of bodily growth and becomes constant at some time about the age of sixteen, declining later in life with advancing old age.*

These facts have important bearings on the problems of education and of the efficient fitting of individuals into the economic structure of society. That there is wide inequality in intellectual capacity is not a very surprising finding. Few men have the capacity for muscular development necessary for a first-rate navvy or prize fighter, and similarly few only have the amount of intelligence necessary to make a first-rate business man or lawyer. In an ideal organisation of society, every man would be in an employment suited to his intelligence. The person with an intelligence quotient of 80 to 90 is neither happy nor efficient if he holds an administrative or organising post which requires an intelligence quotient of about 120. Similarly, a man with an intelligence quotient of 120 is neither happily nor efficiently employed in manual labour.\*

\* Results have been obtained, for example, in investigations of monotonous work, which seem to show that this kind of work may be done better by persons of low intelligence than by persons of greater intelligence.

Misleading sociological conclusions are sometimes drawn from the results of mental testing. For example, an American writer says: "The civilised races of the World are biologically plunging downward," and quotes, as evidence of this the fact that "The army mental tests have shown that there are, roughly, forty-five million people in this country who have no sense. Their mental powers will never be greater than those of twelve year old children."<sup>270</sup> Dean Inge, in the *Edinburgh Review*, quotes the same facts as evidence for mental degeneration in civilised countries.<sup>111</sup>

It should be clear that the results of testing the intelligence of one generation cannot be evidence of intellectual degeneration until we have records of the intelligence of previous generations with which to compare them. The suggestion made by these writers is that the average intelligence is lower than one would expect, but really we have no data on which to base our expectations at all. Forty-five million people with intelligences less than those of twelve year old children sounds a very large number of unintelligent persons, but the fact is less impressive when we remember that the average intelligence for the whole population by this method of measurement is only sixteen years, and that this intelligence is no more than innate educability. When the first writer says "mental powers" instead of "intelligence," he is subtly falsifying the facts, for "mental powers" includes more than innate educability. The knowledge which comes from learning and the wisdom gathered from experience are something more than innate intelligence and make up a great part of our "mental powers"

What seems to be at the back of the minds of these writers is that there are more people of subnormal intelligence than of supernormal. This, however, is mere nonsense. Our only measure of the normal intelligence is found by taking the mean, or median\* of all the intelligences measured. It is a clear necessity of mathematics that there are just as many people of more than median intelligence as there are of less than median intelligence. This fallacy has extraordinary vitality. Since the publication of the first edition of this book, a public speaker achieved notoriety by stating that a quarter of the population of Scotland were mentally defective—a result obtained by treating the first quartile of observed I.Q.'s as the limit for mental defect.

\* Which are, in fact, the same, for the curve of the distribution of intelligence is practically symmetrical.

There is, indeed, no direct evidence of any progressive change either for the better or for the worse in the average of human intelligence. Intelligence tests have not yet been used long enough for a direct comparison of successive generations, although Terman has started a scheme of research not limited to the length of a single life-time which will provide answers to this and many other questions for the information of our descendants. There is not even any evidence that human intelligence has increased since the time of our ancestors of the stone ages. It is indeed stated that the average capacity of the skulls of stone age specimens of *Homo sapiens* is slightly greater than that of modern men.<sup>140</sup> While the conclusion that we are less intelligent than they were would be a very uncertain one (since the correlation between intelligence and skull capacity is small), this observation makes it unlikely that there has been any great increase of intellectual capacity since that time.

In spite of this absence of direct evidence, there are considerations which make it exceedingly probable that there are causes at work producing a general lowering of intelligence level which will be measurable in a few generations. It has been shown by many investigators that the size of families is negatively correlated with the intelligence of the parents. If, therefore, intelligence level is largely hereditary and if there is no inherited effect of education or other favourable environmental factors, it follows that in successive generations the average level of intelligence may be expected to deteriorate. It is almost certain that these two assumptions are true, and the resulting possibility is serious.

It is interesting to enquire how far men's occupations are at present related to their intelligence quotients. The difficulties which arise from the uncertainties in the testing of the intelligence quotients of adults may be avoided by attacking the problem indirectly and inferring the distribution of intelligence amongst men in different occupations by measuring the intelligence quotients of their children.\* This was done in Northumberland.<sup>68</sup>

\* The intelligence level of the mother is, of course, of equal importance with that of the father in its influence on that of the children. Since, however, the average of a large number of families is taken in the above investigation, the neglect of the intelligence of the mother will have no serious effect on the reliability of the result.



The cases examined were not numerous enough for any certain conclusions, but the figures showed a distribution of intelligence which was roughly what would have been anticipated. Men holding professional and administrative posts were found, on an average, to have children of highest intelligence level, while the average I.Q.'s of the children grew progressively lower through the less responsible occupations down to the lowest grades of manual labour.

A result obtained by the method of averages cannot, of course, show that the position is altogether satisfactory from the point of view of social efficiency. Even if, on the average, persons holding professional and administrative posts have the highest intelligence, it remains possible that there are a considerable number of individual misfits (*i.e.* persons of low intelligence in administrative posts, and persons of high intelligence doing manual labour). These misfits would represent a serious loss of efficiency in the social organism. An attempt to estimate the extent of this loss has been made by two sociologists.<sup>88</sup> They find that, although in Great Britain the proportion of children of very high I.Q. (the uppermost one per thousand) is greater amongst those with sufficient means to give them satisfactory educational opportunities, the absolute number is just as great amongst the much more numerous wage-earning members of the community. Of the 50 per cent. children of this exceptionally high intelligence level who are the offspring of wage-earners, some have sufficient educational opportunities provided by scholarships, but it seems probable that the greater number of them fall into the class of those whose abilities are not socially utilised through lack of educational opportunity.

## 7. Education and Intelligence

It is in the field of education that the theory and practice of intelligence testing have their most important consequences. The full implications for education of the results

of intelligence testing are at present only partially realised. Already there are special schools for the education of mentally defective children (of less than 70 I.Q.) in which they are given an education more suited to their needs than that of the ordinary schools and are saved from the discouragement which would result from being backward in ordinary classes and perhaps being punished as idlers by ignorant teachers. These schools are excellent and suffer only from the disadvantages of being expensive to run and of having a social stigma attached to attendance at them. There is much to be said for the provision of similar schools for exceptionally gifted children. These too, cannot be educated efficiently at ordinary schools. Indeed it is the experience of clinical psychologists that children who have earned the reputation at school of being dull prove sometimes to be those of exceptionally high I.Q. for whom the work of their class was too easy to be interesting.

A partial solution of the problem is to be found in the provision of triple classes in the same school for children of low, of normal and of high intelligence. The disadvantages of labelling the children in this way can be avoided by giving the classes some name which does not indicate the differences in intelligence level and by taking care that the children do not know the real principle on which the classes have been divided.

The division of children into the more and the less intelligent took place before intelligence tests were invented. The new contribution of the intelligence test is that it can make this division more accurately and more economically than by any other means.

At present, intelligence tests are little used for this purpose and children of high and low intelligence levels are separated and directed towards different destinies in after life during the process of education itself mainly by the examinations which occur in its course. This is a

very uneconomical method. It means, that every child is given an education which assumes a fair level of intelligence and that those who fall below that level only discover this by failing to fulfil the requirements of that education. It has plainly not been the education best fitted for their needs, and the stigma of failure leads to an attitude of discouragement which is likely to hamper their later lives. This use of the educational process as an instrument of selection involves unnecessary pressure on both teachers and pupils since the educational aim is inclined to become that of passing as many children of low intelligence quotient as possible through examinations which are designed to prevent them from passing.

The use of intelligence tests for this purpose of discrimination can liberate the educational process for its proper purpose of giving every child the equipment of knowledge and skill for which his innate capacities fit him, without pressure to make him acquire more than is possible for him. Education can thus be humanised and made more efficient. The principal obstacle to this advance is the widespread popular ignorance of the reality of innate differences in intellectual capacity and the attribution of educational success to hard work and of failure to idleness. It must be understood that capacity for educational success is an inborn character like hair colour, and is deserving neither of praise nor of reward, and that lack of intellectual capacity is also undeserving of blame. Industriousness is a character trait of great value but it is not best developed by an educational system which demands equal performance from all children irrespective of their capacities.

## **8. Intelligence and Race**

Many attempts have been made to determine whether there are racial differences in intelligence. For many reasons, these have been inconclusive. In some, the methods of sampling have been unsatisfactory. It has not

always been found possible to eliminate the effects of differences in social status (as, for example, between white Americans and American negroes). Also it is unlikely that tests devised and standardised in one cultural setting give a valid estimate of the intelligence of an individual living in a very different cultural environment.

Nevertheless, certain conclusions may be drawn with a considerable degree of probability. Differences of average intelligence between the members of different European races and of the stocks derived from them seem to be non-existent or too small to be detected by present methods. Also there seems to be no measurable difference between the intelligence of Europeans and the Chinese and Japanese. There is, however, some evidence of slight superiority in average intelligence in Jewish children.<sup>108</sup> Although all investigations of the intelligence of Africans and of American negroes suffer from the defects above mentioned, it seems reasonably certain that the average intelligence level of negroes is lower than that of the white races, although it is likely that the difference has been over-estimated in the past.<sup>106</sup> Such races as the aborigines of Australia are probably of still lower innate intellectual capacity.<sup>104</sup>

If this is true it lends no support to the popular view of "race inferiority." If the average negro intelligence is less than the average of the white races, this is no evidence of a general inferiority but only of inferiority in one specific respect—in average innate intellectual capacity. It will have certain general effects—e.g., a larger proportion will be unable to adapt themselves successfully to the demands of a complex competitive civilisation. It means, however, only that the average negro differs from the average white man in a respect in which individual white men differ amongst themselves. Both white and negro groups have a wide scatter in intelligence level, and the popular view that "negroes are unintelligent" neglects the obvious truth that an intelligent negro is just as intelligent as an equally intelligent white man. It seems probable, however, that there are fewer of them.

## 9. Formal Training

The question of the existence of general intelligence is bound up with the practical educational problem of the value of formal training. Under the influence of the faculty psychology, it was supposed that if children were exercised in, let us say, one branch of memory, the improvement in that single operation would be transferred as a corresponding improvement in any other kind of memory, or that repeated exercise of imagination would result in a general improvement of the faculty concerned.

Similarly, if there exists one single factor underlying all kinds of performance, as is maintained in the more modern theory of general intelligence, it might be hoped that training in one kind of mental operation would be followed by general improvements in all operations.\*

This problem is discussed in the Board of Education Report on Psychological Tests.<sup>277</sup> It is pointed out that the early experiments on mental transfer were mainly negative in their results and seemed to show no improvement in one operation resulting from training in an allied operation.<sup>242</sup> Much of the earlier evidence was, however, inconclusive since the psychologists had no adequate mathematical weapons for detecting relationships. It was not until statistical methods were applied to psychological data that precise conclusions on such matters could be drawn. By the application of these new methods the significance of the figures obtained by earlier experimenters on correlations between different abilities was found often to be quite different from that which the experimenters themselves had supposed.

\* This conclusion would not, of course, necessarily follow from the existence of a general factor, for the general factor might not be improvable by training. It is, in fact, agreed amongst the defenders of the general factor theory that such general transfer of training does not take place. Spearman says, for example, that variations of training, within normal limits, appear to have no influence on the general factor, but only on the specific ones.<sup>98</sup>

As examples of the experimental work which has been done on the value of formal training, we may take two sets of experiments which have been claimed by experimenters as pointing to opposite conclusions. These are the experiments of Ebert and Meumann<sup>69</sup> and of Sleight<sup>216</sup> on the transference of ability gained in one kind of remembering to other kinds of remembering.

In both of these sets of experiments a number of persons were tested in various forms of learning, such as the learning of dates, of nonsense syllables, of poetry, of prose, and so on. They were then given intensive practice in one kind of learning, and were retested in all the kinds of learning to find out whether improvement occurred only in the kind of learning practised, or whether it also occurred in other kinds of learning as well.

The conclusion of Ebert and Meumann was that such transfer did in fact take place. They say: "There are no doubt related memory functions which can be perfected upon any material involving the use of memory, the development taking place proportionally to the degree of relationship between the practice and the test material."

Sleight used a larger number of subjects and measured the effect of the training on the test material itself by having a control group of subjects who did the tests only without any special training at all. His conclusion was that when allowance is made for the effect of training on the test material itself, and the probable error of the final results has been calculated, there remain no significant figures in the final test results showing improvement in the power of remembering other kinds of material than those on which the subjects had been trained.

Subjects, for example, who had practised learning in prose did not show any greater improvement in their power of learning poetry than those subjects who had had no training at all. He draws the conclusion, therefore, that there is no transfer of ability gained in one memorising process to another, unless the two have

common elements. Even then transfer does not always take place. In any case, training in remembering one kind of material has an enormously greater effect on subsequent ease of remembering that kind of material, than does training even in a closely related kind of material. This suggests (as Meumann himself believed) that the most economical way of training in any particular kind of memorising is to carry out training in that memorising process itself, and not in some different but related kind of memorising in the hope that transference will take place.

Thorndike has performed an extensive investigation which points in the same direction as Sleight's results. His problem was how far training in one school subject affected performance in other school subjects.<sup>240</sup> There was generally (but by no means always) a slight positive effect, but it was always small. Those school subjects in which training showed the greatest positive effect were not those which have generally been claimed by educationalists as especially valuable for their general effects: training in book-keeping appeared to have greater general effect than training in Latin. The belief that study of Latin is of great value as a general training of the mind appears to have been founded on two facts: that (in the past at any rate) it has been the boys of superior intelligence who have studied the Classical languages and also that the difficulty of these has made them an effective intelligence test (although, of course, one that is very extravagant in its demands on school time, effecting in several years a sifting of bright from dull pupils which a modern intelligence test could do in an hour).

Certain qualifications must be made in the general denial of the transfer to other subjects of improvement due to training in one subject. Such transfer may take place if the two subjects contain *identical elements*. Thus training in arithmetic cannot fail to improve ability in algebra if the training produces improvement in mathematical operations which are not merely similar in the

two subjects but actually the same. Also (as has been pointed out by Bagley<sup>11</sup>) transfer of improvement may take place if there is deliberate teaching of generalised habit systems common to two subjects. Thus accuracy in thinking will not follow as a mere by-product of teaching science but may result if science lessons are made the occasion for drawing attention to the fact that the methods used are not peculiar to the subject under discussion but are generally valid for the discovery of truth.

We must notice too that the experimentally ascertained facts do not support the extreme proposition that there is no transfer of intellectual training. The fact that, in Sleight's experiments, the probable error of measured improvement is too large for any significance to be attached to the apparent improvement does not prove that no improvement takes place but merely that if transfer takes place it is too small to be detected by the methods he used. It is also possible that the smallness of the measured effect of transfer is not due to the fact that there is no transfer but to the fact that general training is, in any case, taking place to the maximum possible extent in ordinary school work so that the additional training given by the experimenter has very little effect.

The practical conclusion, however, is unaltered by these considerations. Under existing conditions of school education, transfer of training is shown to be small. Whatever we wish children to learn must be taught to them directly. If we want them, let us say, to think clearly we must teach them that, and not mathematics or Latin in the hope that there will be a transferred effect. Such indirect teaching will either be wholly ineffective for the purpose aimed at or at least so uneconomical as to be unjustifiable. The only valid justification for teaching mathematics and Latin to children is that we want them to know these subjects. No subject can justify its place in the curriculum by its alleged value as a method of general training.



## CHAPTER XXIV

### THE PSYCHOLOGY OF AESTHETICS

#### 1. Natural Objects of Beauty

The pleasurable reaction which we call the experience of beauty is obtained both from works of art and from natural objects. In the pleasure which we get from natural objects many different factors seem to enter and our total reaction when we describe a scene as a beautiful one is the resultant of all these factors. The free exercise of any of our behaviour tendencies is pleasurable and any object which demands such activity tends to give pleasure when we look at it. The pleasure we derive from the appearance of a mountain is not unconnected with the joy of climbing it. Any scene which has associations with pleasant incidents in our lives attains this same simple pleasure-giving quality. Apart from these, however, there is a pleasure in green foliage, running brooks, and sunshine, which is probably the primitive response of the organism to beneficial environment conditions.

One of the most important objects of natural beauty is the human form. It cannot be doubted that the pleasure taken in the appearance of the human form is the result of the appeal it makes to the tendency with a more powerful content of pleasure than any other—the sex instinct. The form most strongly appreciated as beautiful is almost invariably that of the opposite sex,\* and the form most highly esteemed, at least by the early painters, was that most suited to be the sex-object. Indeed, Schopenhauer

\* Homosexual men, however, find, as we might expect, the forms of their own sex beautiful, just as normal men find the forms of women beautiful.

maintained that, apart from sensual feeling, there was nothing to admire in the outline of a woman's body, which appeared to him from the purely aesthetic point of view to be ugly.

Those who appreciate the widespread symbolism of sex will not doubt that sexual associations lie at the bottom of the beauty perceived in many other objects. At least, we must recognise that much of the pleasure in works of art may be due to their unrecognised appeal to sex emotions.

## **2. Works of Art**

We do not know how early in history men first began to impress upon objects made for their use those qualities of form which made them also beautiful. Pictures of reindeer and bison found in caves of palaeolithic age may have been originally intended for magical control of success in hunting, but some of them have also a beauty of form which awakens an aesthetic response in the beholder of the present day.

The artistic impulse may find its expression by the giving of beauty of form to an object designed for use. Knives, jars, and vases of early civilisations, like the best of our own time, often show the mark of having been made by men not satisfied only with making serviceable implements but desirous also of giving them pleasing qualities of form.

Although in theoretical discussion it is not unusual for attention to be focussed on the psychologically simpler expression of the artistic impulse in works of fine art, such as paintings, music, etc., which serve no other purpose than the aesthetic one, it must not be forgotten that the imposing of artistic form on objects of use is as characteristic and important an expression of the aesthetic energy of a society as is the creation of works of fine art.

The creation of a work of art is always a social activity. The creator intends to awaken some response in persons seeing or hearing this work. We may call this response the *aesthetic reaction*, without trying to decide whether this reaction is always or is merely a response of pleasure, or whether all aesthetic responses are of the same kind.

### 3. Art Production and Appreciation as Social Phenomena

The production of works of art is socially conditioned. The artist is putting the product of his own mental activities into a visible or audible form so that his experience may be shared by other people. The number and the character of works of art is largely determined by social demand. If devotional pictures for the adornment of churches are required by the society in which he works, the artist produces religious pictures; if they are required for decoration of houses, he produces landscapes or figures. The derivative artist shows the greatest dependence on the generally accepted aesthetic standards of his time, producing works of art which call up the habitual perceptual and emotional reactions of the majority of the members of the society to which he belongs, but performing no social function of enlarging the range of these reactions.

The original or creative artist is, nevertheless, not free from the influence of his social environment. He also inherits the traditions of past workers in his own subject, and produces works of art in response to a demand from some or even the majority of the members of his society. He differs from the purely derivative artist in the fact that he is not content to satisfy this social demand by the production of familiar art forms but is only satisfied with producing something new, usually along familiar lines but sometimes along relatively unfamiliar lines.

His freedom of innovation is limited by the improbability of any of his potential audience reacting appropriately to excessive novelty in art and also generally by

the limits of his own capacity for so reacting. It is very commonly further limited by his membership of a school whose general traditions and technical methods he shares. When an original artist is working along generally unfamiliar lines, those appreciating him in his own time may be limited to a small group and it is by this group that his production is socially conditioned. This appeal of a work of art to a small group is, however, neither a general nor a sufficient condition of its being original. *The Shropshire Lad* is not less truly a creative work of art than *The Waste Land* because its general method is familiar and widely appreciated, and much poetry which to the common man sounds as obscure as *The Waste Land* is entirely imitative.

Aesthetic appreciation is no less socially conditioned than artistic production. Gothic cathedrals which seemed beautiful to their builders and seem beautiful to us now, were considered at best as inferior, at worst as ugly, by the architects of the Renaissance. The pictures of the early impressionists were considered to have no artistic merit at all by the contemporaries of their painters, but afterwards, when they had become socially recognised, they were sold for large sums of money, and people experienced genuine aesthetic pleasure in looking at them. Now that people have grown accustomed to look for the qualities of design which have characterised the principal painters of more recent times, these early impressionist paintings tend to appear to them to be formless, and declining aesthetic appreciation of them is reflected in declining market valuation.

One may be tempted to say that an appreciation which follows social convention is not a genuine aesthetic reaction. Certainly it is obvious that an attitude towards a work of art which is merely determined by what the individual knows of current fashions in taste cannot be regarded as a truly aesthetic attitude. It remains true, however, that all appreciation of works of art is partly

determined by the factor of current social judgments. The condition for the production of aesthetic reactions is not merely that the objects looked at should have certain characters of form but also that these characters should be socially approved.

This does not mean that there are no absolute standards by which the merit of a work of art may be judged, but only that these are not the sole or even the principal factors in determining an individual's judgment of its merit or of his aesthetic reaction to it. His artistic taste, in fact, is likely to be largely determined by his own individual history of previous experiences of art as well as by his acceptance of a socially approved standard of taste. Thus his own immediate reactions to a new work of art are a very uncertain ground for making a judgment as to its merit. A strong immediate reaction may mean that it is a derivative work of art calling up previously formed and common emotional associations, while failure to react may result from the fact that it is a creative work of art along unfamiliar lines.

Of course, it is also true that people differ very much in the extent to which their aesthetic judgments are determined by social conventions, but this applies to all social influences. The fact remains that social approval of certain art forms is one of the conditions under which the aesthetic reaction of the individual appears, and that in practice this factor cannot be isolated from the other factors productive of pleasure in works of art.

#### **4. Aims of Art Production**

Not all art products are intended by their creators to call out the same kind of response. Some painters and poets intend to arouse tender emotion by the representation of an affecting incident, while others would regard such an aim as a degraded one and are interested only in imposing order and design on their material. Others may have

both aims or different aims. Reactions appropriate to works of art of one kind may be inappropriate to those of other kinds.

Wilenski distinguishes three kinds of painting with different artistic aims.<sup>271</sup> *Classical* (or *architectural*) painting (such as that of Raphael, Vermeer, Cézanne and Braque) is like architecture in being concerned to create an organised and complete whole out of the lines, masses, etc., which make up the picture. Whether or not it represents actual objects, it is primarily concerned not with the emotional significance or with the appearances of the objects themselves, but with the configurational properties (or the design) of the whole into which they are combined. *Romantic* painting (such as that of Rembrandt, Degas and van Gogh) has the object of communicating the emotion belonging to an emotional situation or object. *Descriptive* painting (such as that of Constable, Corot, and Crome) has the simpler aim of representing on canvas objects of natural beauty so that the painting should call out the same reaction as the natural objects themselves.

This is an important distinction in the psychology of art production since misunderstanding of works of art must result from failure to understand which of these aims has dominated the artist. Such architectural painting as that of Cézanne, for example, is often condemned by an observer who treats it as descriptive art by an artist who has failed to achieve the descriptive aim through technical incompetence. The general tendency to judge the merit of pictures by their success in conforming to a technique of naturalistic representation in which the mathematical laws of perspective are strictly obeyed and the picture is as much as possible like a coloured photograph, is an example of the influence of habit and social convention on art judgment. An architectural or a romantic artist may distort natural forms for aesthetic ends—in order to improve the quality of design or to heighten emotional effects respectively.

While these may be admitted as different dominating tendencies in different artists, it may be doubted whether they exist as separately as this account seems to imply. The line that separates descriptive from romantic painting is a very indefinite one and there is probably very little original art, whether romantic or descriptive, which does not depend to some extent on the character of formal design, although this may not be its dominating motive.

Romantic art cannot properly be distinguished by saying that it calls up emotion or even that it calls up stronger emotion than other kinds of art. A purely descriptive painting may call up the emotion belonging to natural objects of beauty, and a purely "architectural" painting may in some observers rouse strong emotion by the formal qualities of its design. The distinguishing feature of romantic painting is that the main object of the artist is the communication of the emotional associations of the object or situation represented.

Similar distinctions of aim can obviously be made for other arts. In poetry, a rhythmical pattern of metre, rhyme, alliteration, etc., is imposed on words which may be descriptive of objects, of emotional situations, of states of mind, and so on. Poetry may be descriptive or romantic although the element of formal patterning is never absent. Music also is either "romantic" or "classical" in aim (never purely descriptive except occasionally or incidentally). It may aim at the arousal of emotions belonging to an emotional or romantic scene (as Ketelbey's "In a monastery garden") or it may depend for its effect on the configurational qualities of the music itself. The effects of different kinds of music on different persons, and the correlations of these differences with such other differences as those in musical education, powers of auditory remembering, capacity for the perceptual organisation of complex wholes, etc., are interesting problems for experimental research on which little has yet been done.

## 5. Individual Differences in Response to Works of Art

It is obvious that the same work of art will call out different responses from persons whose individual tastes differ as a result of differences in previous experience and training. It is less generally recognised that there are widespread differences of a more fundamental kind in the perceptions of different individuals.

These differences are well known to exist in music, although their nature is often thought of very vaguely. Teachers of music say that certain children have "no ear," and find that they respond very little to musical training. The most common idea of this defect seems to be that it is insensitivity to differences of pitch (or "tone deafness"). Complete insensitivity to pitch differences would, of course, mean that the child was unable to understand human speech, and is not found to be the cause of difficulty in musical training. Seashore has devised a number of tests for the measurement of the sensory capacities needed for musical appreciation and performance.<sup>212</sup> He finds that capacity for pitch discrimination shows wide individual differences and that although a low sensitivity to pitch differences is a handicap in some kinds of musical performance, it is not a very important factor.

Perhaps more important than sensory differences are perceptual differences on which comparatively little research has been done. All works of art have a form or pattern imposed on their content. Response to this form is a perceptual activity which may take place in a different degree in different individuals so that to some the work of art may not truly be perceptually present at all. A succession of notes, for example, has a form resulting from pitch and time relations—melody and metre. The perception of a melody depends not merely on distinction between the pitches of successive notes but also on the perception of these as a unitary configuration. The



complexity of pitch successions which form such unitary melodic configurations certainly differs in different individuals (even apart from the effects of training) so one man may find a piece of music chaotic and tuneless whose melodic form is clear to another.

Similarly a whole work of music has its own configurational properties; it forms a greater pattern of which the lesser patterns of its melodies are constituent elements. This larger pattern may not be perceived at all by a hearer to whom the whole work is simply an aggregation of melodies. He may take great pleasure in the hearing but will necessarily miss much of the essential purpose of the composer. We may thus understand the popularity of the aggregations of unrelated melodies from various sources which form a considerable part of popular music.

Similar perceptual factors are found in other arts. A picture is formed of parts in relationship to each other. This relationship, in which may lie the aesthetic quality of the picture, cannot be appreciated if the observer does not see the parts in the same way as the artist intended. Thus a picture by Cézanne may appear to an observer to be a mere muddle until his perception becomes articulated into the interrelated parts intended by the painter. Some pictures are intended to be seen as flat surfaces, others as three-dimensional. For example, the design of Braque's pictures depends on their three-dimensional character. If they are seen as flat, their total design does not appear. A common opinion that they lack qualities of design is probably put forward by those who see them flat. I have found myself that these pictures tend to appear flat to binocular vision but that I can see them as three-dimensional if I look at them with one eye through a tube. Many other people (including probably the artist himself) see them as three-dimensional without any special device. To these the aesthetic purpose of the artist is apparent without difficulty. Most pictures may be seen

either as masses or as outlines. If the design of the artist is a relationship between the outlines, this design may be wholly lost to one who perceives the picture as a system of masses.

Experiment shows also a wide individual difference in the extent to which different individuals perceive the mathematical relationships of perspective.<sup>245</sup> This does not affect the ability to perceive design but may much affect the representational character of a painting. It has become traditional in Western art to reproduce the convergence of parallel lines, the diminishing sizes of distant objects, etc., in full as they would appear in an image cast by a lens, in spite of the fact that these effects only appear partially (and for many people very little) in the perception of an actual scene. For those whose tendency to see things in their "real" shapes and sizes is small, traditional perspective is a close enough approximation to what they see, and art in which it is not generally used (such as that of the Chinese, the Indians and some modern Western painters) seems to them to be non-representational; while those with a large tendency to see the "real" characters of objects find no such difficulty. There is indeed reason to suppose that differences in traditions as to the representation of perspective may be due to racial differences in perception. A group of Indians, for example, showed a greater tendency to see the "real" characters of objects than did Europeans.<sup>246</sup>

It is therefore clear that, apart from differences in taste, there are sensory and perceptual differences which may determine aesthetic reactions. We cannot be certain that two persons making different judgments of the quality of a piece of music or a painting are differing in taste about the same object. Their perceptual differences may be such that, as phenomenal objects, the works of art they are reacting to are very different and have very different artistic qualities.

## 6. Sources of Aesthetic Enjoyment

Different theories of what produces the enjoyment in works of art have been put forward by philosophers, from Aristotle who said that it was "order, symmetry, definiteness or determinateness" combined with "a certain magnitude," to Lipps who regards the essential factor in artistic enjoyment as what he calls *Einfühlung*.<sup>\*145</sup>

These theories, however, we must leave to the aesthetician, and confine ourselves to a consideration of experimental work on this subject. This has been undertaken by Bullough, C. S. Myers and Valentine. An interesting result which emerges from all practical work on the appreciation of artistic beauty is the variety of sources from which subjects report that their pleasure is derived.

Bullough used as his material single colours and also pairs of colours. He asked his subjects to report whether they liked them or not, and to give their reasons for their likes or dislikes.<sup>41, 42</sup> He found that he had four types of reply. Some replies showed that their subjects were taking an intellectual and critical attitude towards the colours themselves. He called these the *objective type* of reply. Other replies spoke of the physiological effects of the colours, referring to them as stimulating, warming, etc. These were replies of the *physiological type*. Other subjects referred to associations with the colours, and liked or disliked colours, as they suggested to them pleasant or unpleasant things or situations—the *association type*. Lastly, there were replies of what Bullough calls the *character type*. These were replies of subjects who read feelings and human characteristics into the colours—speaking of them as jovial, energetic, and so on.

\* This is generally translated into English as *empathy*. It means the emotional placing of the observer himself in the observed object, producing the feelings he would have in the position of the object, e.g. the feeling of strain he would have if he were himself in the position of a column in an architectural work of art.

Bullough's experiments were made with material of a very simple kind. It is very doubtful whether reactions to single colours are aesthetic reactions at all. The observations have been repeated, however, with more complex art material and the results have been, on the whole, to confirm Bullough's types. Valentine used pictures in one series of experiments,<sup>256</sup> and Myers used music reproduced by a gramophone.<sup>175</sup>

Myers found that his replies, like those of Bullough, could be divided into different types in which the appreciation was attributed to different kinds of experience. He called these by the same names as Bullough, except that he replaced the word "physiological" by "intra-subjective" and included in this class all reports of experiences which were sensory, emotional, or conative. He found that single subjects did not always give reports of the same type. Examples of what is meant by the different types of response may be taken most conveniently from Myers' paper since he used actual art material, so the judgments of his subjects are of the same kind as ordinary artistic judgments.

1. INTRA-SUBJECTIVE REPORTS.\* "That was lovely . . . Something lifting, raising you inside. Like what one gets in church"

"All through, very very sad. Sensations of something coming up from the abdomen and surging up to the head."

\* An American experimenter has obtained results which suggest that all musical appreciation is accompanied by physiological effects that can be measured by suitable apparatus<sup>110</sup> The electric current from the heart-muscles of subjects listening to music was measured by a string galvanometer, and the rate of the pulse, and the systolic and diastolic blood-pressure were measured with a Tycos sphygmomanometer. Changes were noted in these functions whenever the persons studied were sensitive to the music played, but not when they were indifferent to it (i.e. persons who were affected by the music at all always showed measurable physiological effects). Tchaikowski's Tragic Symphony was found to have a depressing effect on the functions measured, while the Toreador song from Carmen, and the National Emblem March played by Sousa's band stimulated the

2. ASSOCIATIONS. "A cave, rocks, sea-waves . . . a sea-serpent poking its head out of the cave (suggested by the trombones), dancing spray, with the sun on it. I could draw the exact picture."

"The beginning reminded me of a stage, people coming on. It was trivial, theatrical."

3. OBJECTIVE REPORTS. "I noticed the second horn was too loud . . . When the second tune came with the 'cellos, it didn't stand out enough"

"As always in Beethoven, one must notice the tremendous . . . contrasts, especially dynamic contrasts. His crescendoes always give me pleasure. Beethoven makes scale passages so much more interesting than, say, Liszt."

The same subject remarked, "To me music is never sad or joyful. I only get aesthetic impression."

#### 4. CHARACTER REPORTS.

"There is something sinister about it."

"A distinctly pathetic ring about it."

"The piece sounded cheerful in certain parts, but I felt in a contrary grain all the time." (Showing the independence of character and the intra-subjective attitudes.)

The most obvious conclusion to be drawn from these experiments is that when different people are appreciating music or any other art material, they may have widely different sources of response. Indeed, these differences are probably greater than the experiments reveal, for the subjects were only able to report their conscious sources of response, and it is likely that the aesthetic response to art

cardio-vascular system (except in the case of individuals who disliked these pieces of music, on whom it was found that they had depressing effects) This suggests that measurable visceral effects exist more widely than in the few individuals who mention them as the basis of their aesthetic judgments, and that even when not recognised they may exert an influence on these judgments. It would be interesting to apply these measurements to musical material less obviously stimulating and depressing than the three pieces chosen for this research, and to other forms of art material (paintings, architecture, etc.).

material is often of unconscious origin. When listening to music, the affect which appears in consciousness may often be due to associations which are shut off from consciousness by repression, and we may be deeply moved by art material of poor quality to which the conscious associations are of a trivial kind.

## 7. The Nature of Aesthetic Appreciation

Bullough regards the character type of judgment as the one belonging to the highest form of aesthetic appreciation.<sup>42</sup> In descending order, he grades the other types as follows: fused associations (imagery, etc., suggested by the art material but felt to be part of it and not as something extraneous to it), the objective type of report, non-fused associations, and lastly the pure physiological type, which he regards as having the lowest aesthetic value.

We may note, however, that not all aestheticians would agree with the order of Bullough's hierarchy. To many, the objective attitude appears to be the aesthetic attitude *par excellence* (e.g. T. H. Lyon).<sup>150</sup> Bosanquet gives as his psychological definition of aesthetic enjoyment: "Pleasure in the nature of a feeling or presentation, as distinct from pleasure in its momentary or expected stimulation of the organism."<sup>28</sup> In the terminology provided by Bullough's experiments, we may say that Bosanquet would include the character and objective attitude under the term "aesthetic enjoyment" (for in both of these, pleasure is taken in the nature of the presentation) but would exclude the physiological attitude.

All of these writers seem to regard a physiological reaction as low in the scale of aesthetic responses. Yet certainly many people genuinely sensitive to works of art find that an emotional thrill of recognisably organic origin is a characteristic part of the response to works of art. Thus A. E. Housman, one of the greatest of modern

lyric poets, describes three physiological reactions in a reply to a request that he would define poetry.<sup>108</sup> He writes: "I replied that I could no more define poetry than a terrier can define a rat, but that I thought we both recognised the object by the symptoms which it provokes in us. . . . Experience has taught me, when I am shaving of a morning, to keep watch over my thoughts, because, if a line of poetry strays into my memory, my skin bristles so that the razor ceases to act. This particular symptom is accompanied by a shiver down the spine; there is another which consists in a constriction of the throat and a precipitation of water to the eyes; and there is a third which I can only describe by borrowing a phrase, . . . 'everything that reminds me of her goes through me like a spear.' The seat of this sensation is the pit of the stomach." Housman apparently believes that those who do not react in some such way are insensitive to poetry, *i.e.* lack the true aesthetic reaction to poetry. This too is a defensible verbal usage.

We see that there is considerable difference of opinion as to what kind of reaction is to be regarded as the truly appropriate one to a work of art. This difference of opinion is to be expected if we bear in mind the wide individual differences in different people's perceptions of works of art and also the differences in aim of different kinds of art. Romantic music, for example, may deliberately aim at the arousal of associations while classical music has no such aim. The associative type of response is appropriate in the one case and not in the other. The psychology of art must note this diversity of response and diversity of aim, while leaving to others the discussion of the degree of aesthetic respectability of these different responses and aims.

There is, however, a question raised by the observation of the different kinds of experience found in the appreciation of works of art, which falls more within the province of psychology than the question of their aesthetic values.

This is the question of the order in which these different ways of appreciation appear in the artistic development of an individual.

Do we, for example, all begin by feeling the physiological effects of art products, and then proceed to some other way of appreciating them? Not sufficient work has yet been done on this problem to enable us to offer a solution with any confidence. We can do little more than guess from the indications which are given us by a few observations and experiments. It is not likely that we should find a simple answer applicable to all people.

It is possible that the artist himself tends to adopt the objective attitude towards works in the art he has practised. Myers noticed that one of his subjects who was a professional musician generally gave replies of this kind. This is probably even more true of the art critic; indeed this attitude may be carried so far as to interfere with the pleasure derived from the art to which it is applied. Myers showed that associations were not found in his most unmusical subjects (those who listened to and cared for music least), or generally in the professional musician. The musician seemed to eliminate associations by the assumption of a critical, objective attitude. Highly musical persons were found to have fewer associations than the average person, for they listened to the music for its own meaning and beauty, not for the meaning and beauty derived from associations, but when this mode of aesthetic appreciation failed in the highly musical person, associations began to appear.

## **8. Mental Conditions of Art Production**

A work of art—a poem, picture, statue, or musical composition—generally belongs to the class of things we have already distinguished as mental phantasies. These are creative imaginings, products of mental activity which serve the purpose of compensating for defects in the



environment or providing a subjectively satisfactory solution of other mental conflicts. In addition to the question of what conditions a work of art must fulfill for it to be valuable as art (a question which we must leave to the science of aesthetics), we must ask why an art product (whether good or bad) has come into being at all. These are two questions which must be kept absolutely distinct, for failure to distinguish between them has led to much confused thinking about the value of the psychological study of works of art. It is with the second question alone that we are here concerned.

It is true that much production of works of art needs no further psychological explanation than the money they bring their producer. An economic demand for art products causes the production of much derivative art by those who have learned a technique as a means of earning a living, and, lacking any strong impulse to artistic creation, satisfy popular demand by imitating those works of art which are popularly applauded. It is not with the production of such derivative works of art that we are concerned but with those that are the product of a genuine creative impulse.

The most superficial investigation of the lives of many artists reveals peculiarly severe mental conflicts, due partly to the strength or to the unusual objects of their cravings, partly to unfortunate elements in their external conditions. These conflicts are so common that it is difficult to avoid the conclusion that they are causally connected with artistic production. We may notice, for example, the homosexuality of Michael Angelo, the Don Juanism of Lord Byron, and the Platonic Don Juanism of Shelley. All three of these producers of works of art had peculiarities in their emotional constitution which made their normal satisfaction impossible without social disapproval, and, therefore, produced a condition of conflict. Even earlier than these peculiarities, we find abnormalities in the conditions of their childhood. Byron was on bad

terms with his mother, while Shelley was persecuted by his school fellows at Eton, and carried over into his later life a hostility to all human conventions and to the God who was supposed to sanction them.

Similar conditions of conflict lie at the root of neurotic complaints, and amongst neurotics it is not unusual to find productions similar in form and content to those of artists, but without art value. Pictures may be drawn or poems written. The kind of conflict producing these products may be exactly the same as the kind producing the great works of art. Like the artist, the neurotic may feel that he is producing under an influence beyond his conscious control; in other words, his production may be from subconscious mental levels.

What makes the productions of Michael Angelo or Shelley great works of art is not the fact that they are products of conflicts. It is because these workers have, through hard work, mastered the technique of their own particular art, and because they have an innate capacity which we cannot fully analyse but which is ordinarily called "talent."\* Without talent and technical skill, the products of Michael Angelo and Shelley would have been as worthless as are most of the productions of psycho-neurotics.

The relation between the content of artistic output and the mental conflicts of the artist may be illustrated by reference to Wagner.<sup>178</sup> After exercise of his sex-instinct on a low level in his youth, the reaction of his suppressed "higher nature" produced a longing for the highest form of love which he expressed in *Tannhäuser*. This highest form of love finds expression in an even more ethereal form, more remote from passion, in *Lohengrin*. Dissatisfaction with the conditions of his life, particularly with the social conventions which bound him to a wife he did not love, led him then to depict a natural being free from the constraints of modern social conventions. So in Siegfried we have a phantasy of all that Wagner himself would be.

\* Undoubtedly, what we have already called "general intelligence" is one constituent of talent; unusual power of imaginal representation may often be another.

A new element now enters his life in his love for a woman separated from him both by the barrier of his dying wife and of her own husband. The unhappiness of this love was expressed in *Tristan and Isolde* by the depiction of a pair of passionate and unhappy lovers similarly separated who were united only in death. This composition seems to have relieved the tension of the suppressed system which found expression in it, for in his next work—*The Mastersingers*—no more fundamental conflict in the author's own life seems to be expressed than his irritation against the critics who judged and condemned his music by conventional standards. Lastly, in the strange sexlessness of *Parsifal*, we have the composition of his calm old age when the storms of the sex life are past, and his dreams are of the redemption of men from lust and unhappiness.

However, it is clear that these details of Wagner's life give no explanation of why his compositions are great works of art. Through his technical skill and his talent (the acquired and innate bases of his art, respectively) he made out of the phantasy products of his conflicts music of wonderful beauty. His conflicts alone might have resulted in mere dreaming, in worthless art-products, or in psychoneurotic disease. Probably it is equally true that his talent might have been barren if conflicts and deprivations had not given him an urgent necessity for self-expression.

While peculiarly severe conflicts are so common amongst the producers of works of art as to make it certain that the connection between conflict of unusual severity and art production is not accidental, this relationship is not universal. Wordsworth had a life as free from conflict as most people, but was a prolific producer.\* The deprivations of ordinary life may be sufficient to produce compensation in phantasy amongst people with no particular external or internal cause of mental disturbance.

The production of a work of art or other phantasy product seems to serve the purpose of allaying the condition of anxiety which is its motive force. Art production may itself be regarded as a process of mental healing. The artist is exteriorising his conflicts and allaying the

\* The one irregularity in his otherwise thoroughly socially ordered life seems to have been productive of no conflicts comparable with those of Shelley, Wagner or Byron.

anxiety arising from them. Obviously not completely, or this motive force behind his production would disappear, whereas we know it to be generally persistent.

If this is a true account of the mental effects of art production, this fact is of particular importance in childhood. It is now generally recognised that the years of childhood up to the sixth are a period of great mental stress. The conflicts and anxieties of that time can be resolved by phantasy production by means of drawing, painting and modelling. Thus these activities have a psychotherapeutic value in childhood. Methods of art instruction have altered as a result of recognition of this fact. The prime purpose of the teaching of the technique of an art in childhood is not to make the child a competent artist but to give him sufficient command over his material to make it a satisfactory means of phantasy expression. Too great an insistence on accuracy of drawing and modelling may hinder this process instead of helping it. Encouragement of a freer use of pencil, paint-brush or other instrument is now, therefore, characteristic of early teaching in artistic production.

Adolescence is again a time of mental stress. Most young men have attempted to write poetry and fiction somewhere between the ages of 15-25. Generally it is without merit, and the absence of social approval of their work prevents them from going on with that kind of activity. If by chance it had shown a germ of talent they might have received the approval of other persons, and have found that such writing could serve not merely as self-expression, but would bring in money and enable them to lead such lives as pleased them, instead of earning their living by the drudgery of less interesting kinds of work. They would have had a motive for attempting to improve their technique, and if their talent and intelligence were sufficient, would perhaps have become artists of greater or less renown.

Under the influence of psycho-analytic thought, enquiry into the childhood of artists has become a popular psychological pastime. It has been criticised on the ground that such investigation gives no information as to why these people produced great works of art. Of course it does not, but it may give a great deal of information about other things which are of interest to the psychologist, although they may be without interest to the student of art or aesthetics. The peculiarities of content of artistic productions are determined largely by the conflicts which have given rise to them. It is of interest to the psychologist to inquire why Byron created such figures as Manfred and Don Juan, even though such an enquiry explains nothing of the aesthetic value of these creations.

It would be well at this point to make an attempt to make our terminology clear. The term *phantasy* has already been explained (p. 278). By *phantasy product*, I mean the result of giving a phantasy concrete form, by writing it down, moulding it in clay, or representing it by lines drawn on paper. A *phantasy product* becomes an *art product* when it serves a social function by enlarging the experience of other people by communicating the artist's experience to them. Except so far as the fulfilment of this object of communicating experience to others is necessary to the achievement of the psychological aim of art production, this distinction is not a difference for the producer. It is, nevertheless, a distinction of great practical importance, for the mere phantasy product is socially negligible. An art product may, of course, not be a phantasy product at all if it is a mere copying of nature.

In an art product we may distinguish the *material*, the *content* and the *form*. The *material* is the actual wood, stone, or paint from which it is made. The *content* is the system of ideas and feelings which the product is intended to convey; these ideas and feelings generally (but not always) possess sufficient coherence and unity for it to be possible to speak of them as a phantasy. The *form* is the pattern which the artist has imposed on his material. This is the *configuration* of the work of art as whole, in the sense in which the word "configuration" has been used in Chapter XII.

If a work of art possesses beauty or other artistic merit, this merit is a quality of the art form. While admitting that the

beauty as understood by the aesthetician or the art-critic belongs to the art form and not to the art content, it must also be recognised as a psychological fact that the source of the appeal of works of art to the majority of those who enjoy them is their content much more than their form.

## 9. The Place of Conflict in the Appreciation of Art

The attitude of a person appreciating an art product is not altogether unconnected with the conflict which gave rise to it. If we go to a performance of *Tristan and Isolde*, we do not merely appreciate the beauty of Wagner's music, we also live in the conflict which Wagner is depicting—feeling his passion and the pain of his deprivation, thus working out some of our own conflicts and giving a phantasy gratification to our deprivations, and obtaining mental relief of the same kind as did Wagner when he was composing it.

It is this obtaining of mental relief in the witnessing or hearing of tragic art products by the discharge of emotion belonging to repressed systems, that is apparently meant by Aristotle when he speaks of the function of tragedy as "through pity and fear effecting the proper purgation of these emotions," δι' ἐλέου καὶ φόβου περαινουσα τὴν τῶν τοιούτων παθημάτων κάθαρσιν<sup>9</sup>. The word κάθαρσις would seem to refer to the relief obtained by the discharge in consciously felt and expressed emotion of repressed conflicts of a painful character.

It is probable that the universality of the appeal of romantic works of art depends on the fact that they are depicting conflicts and compensating for deprivations which exist in a measure in every man. In enjoying such a work of art we are feeling with the artist and using the same phantasy material as he uses, because our deprivations are the same as his.

One may see this relationship between the enjoyment of an art product and the deprivations of the person enjoying it in a simple form in the poor girl's enjoyment of romances and cinema films in which the heroine moves in circles of

aristocracy and luxury. The identification between the reader and the heroine is made yet more complete if the heroine is also portrayed as having been drawn from the working classes and elevated to her exalted position by a lucky marriage or accidental circumstance.

These facts make it impossible to be content with a theory of the function of art which treats it as merely a method of giving pleasure. While it is possible that the most developed attitude towards a work of art is the objective or critical attitude in which the subject of enjoyment is the form and not the content, so that a person adopting this attitude may find pleasure in the form of a work of art even when its actual content is painful, we must recognise that this is not the stage at which most persons have arrived. The appreciation of tragedy is the crucial question for a pleasure theory of art. For those whose enjoyment of the art form outweighs the unpleasure of painful content, enjoyment of tragedy presents no problems. Can we say of others who do react to the content, that their emotions of pity or horror, which would be acutely unpleasurable if the sufferings depicted were real, are nevertheless pleasurable when less intensely excited by the unreal representations of a work of art?

Certainly it is true that a work of art may produce different and less painful emotional reactions in the spectator than would the same events in real life. This character of a work of art is part of what Bullough calls its "psychical distance."<sup>43</sup> This distance is, on its negative side, a cutting out of the practical side of things and of our practical attitude to them, and a consequent elaboration of the experience on a new basis. Bullough regards "distancing" as one of the essential characteristics of the aesthetic consciousness.

The theory that tragic art products become pleasurable to the observer because they are art representations and not actual events breaks down, however, if we accept the physiological theory of pleasure and unpleasure (or, indeed, if we use the words "pleasure" and "unpleasure" in

any precise way at all). On the physiological theory, the sensation derived from the bodily condition of depressed functions is unpleasure, and if this condition occurs in connection with our appreciation of a work of art, no verbal juggling can make this experience into one of pleasure. In the experiment referred to above,\* the playing of Tchaikowski's Symphony was accompanied by the physiological condition of unpleasure, just as were the other pieces of music when the subject disliked them. Probably similar physiological measurement would show that most persons during the playing of the *Liebestod* in *Tristan and Isolde* were in the same physiological condition of unpleasure. Indeed, introspection without physiological measurement shows that unpleasure, not pleasure, is the dominant tone of affect in the experience of tragic works of art.

Why, in that case, do people seek such experiences? Apparently because they enable them to bring to the surface painful emotions connected with repressed conflicts, not because these experiences give them pleasure. The ultimate effect of bringing these to the surface is the relief of the tensions connected with them. The function of the work of art may be, and, no doubt, generally is, to give pleasure. This is, for example, true of works of art which, like the cheap romance, are simple wish-fulfillments. An art product may, however, serve the purpose of bringing into consciousness painful repressed material which produces painful emotion.† The fact that people are acted on by a compulsion to put themselves in conditions under which this pain is produced is a simple

\* p 463 n

† It would be a great mistake to suppose that all phantasy production worthless as art is of the simple wish-fulfillment variety, while it is only art products possessing meritorious qualities of form that produce painful emotion. In a camp of fruit-pickers in 1914, the favourite song amongst the pickers was "I'm lonely since my Mother died, My friends and comrades turn from me . . ."—a ditty which in its content, although not in its qualities of form, is allied to the Pathetic Symphony. On



psychological fact, which it is not necessary to rationalise by supposing that the experience sought is pleasurable.

Really what we have to explain about works of art is not why people take pleasure in them, but why they adopt the behaviour necessary to see or hear them (in the language of the behaviourists, why they react to them positively). It is the *appeal* of works of art, not their pleasure-giving qualities, that must be explained. The fallacy of hedonism lies, as we have seen, in the common-sense view (easily refuted by careful observation) that the object reacted to positively is necessarily a pleasure-giving object. Generally it is, but the work of art with painful content is an exception.

the other hand, products with merit as art may be of the wish-fulfilment kind. "I dreamed that as I wandered by the way, Bare winter suddenly was changed to Spring . . ." is an example Of less value as art, but still certainly an art-product is Mrs Browning's *Lady Geraldine*, which has actually the same content (with sex relationships reversed) as cheap romances.

## CHAPTER XXV

### THE PSYCHOLOGY OF SCIENTIFIC AND OF RELIGIOUS DEVELOPMENT

#### 1. The Incentive to Scientific Discovery

The method of the scientific discoverer is sufficiently like that of the artist to make a study of the differences between them a convenient point of departure for the investigation of the psychology of scientific development. The most obvious contrast between them lies in the difference between the material of their mental activities. The artist's activity is the impression of the phantasy products of his own mind on the form of external objects. The scientist's activity is a regulated and methodical curiosity into the nature of external reality. In a certain respect, the interests of the artist and of the scientist are polar opposites. External reality is the dominant interest of the scientist, phantasy that of the artist. The scientist's activities are (in Jung's phrase) extroverted while the artist's are introverted. Abnormal *strength of curiosity* may be said to be the characteristic feature of the scientific type of mind.

The behaviour of curiosity is to be found amongst many animals. Cows, deer, and seals are notoriously curious. Pavlov noted amongst his dogs a response which he called the "investigatory reflex."<sup>181</sup> The curiosity of animals, however, is easily satisfied. The persistent investigation and analysis of unusual and even of common objects which make up the activity of scientific investigation are peculiar to man.

McDougall has attributed curiosity to a specific innate propensity. It seems likely that investigatory behaviour

has an innate basis, although this statement does not help to explain the particular direction of curiosity in a particular adult, and there is no evidence that abnormal strength of curiosity is due to abnormal strength of an innate propensity. It may as well be due to the influence of some environmental factor reinforcing investigatory behaviour. Karl Abraham has claimed that in one of his patients who showed interest in particular problems of many sciences, it was possible to see that this interest was determined by his unsatisfied infantile curiosity about birth.<sup>1</sup> Again, however, there is no evidence that this is a general source of scientific curiosity.

The usual opinion of the scientific interest is that it is directed towards controlling the environment rather than by mere curiosity about it. Wireless telegraphy rather than the enunciation of the electro-magnetic theory of light is generally regarded as a typical achievement of science. There are, in fact, many social forces tending to drive scientific investigation into channels of practical usefulness. Scientific research, like most other kinds of activity, is largely socially conditioned. The social sharing of discoveries by their publication is generally an essential part of the system of incentives behind research. It is very exceptional to find a scientist like Cavendish who seemed to experiment for the satisfaction of his own curiosity without feeling any necessity for the social sharing of his results. The part played in scientific discovery by the interest of other scientists and of the general public tends at any particular time to restrict it to conventionally accepted channels, which are generally (but not always) those of practical usefulness. Thus general interest is much greater in the discovery of a cure for cancer than in the investigation of the electrical properties of the skin. It is also, however, great at the moment in such unpractical problems as the size and distance of the extra-galactic nebulae.

More definite social controlling forces are exerted by the provision of research grants. While some scientific research work is carried out by those with private means or in their spare time by those who earn their living in some other way, an increasing amount is done by those for whom it is a full time occupation by means of which they earn their money. These are dependent on research grants which are provided mainly for practical ends. Bequests are made by those who have suffered from diseases for research into the origin and cure of those diseases, grants are made by governments for the investigation of matters connected with war, and also by industrialists for the scientific problems of their own industries. Medicine, war and industry are the three channels into which this economic control tends to canalise scientific research.

While much that is of value to science comes from the investigation of practical problems, it is fortunate that there are also factors tending to prevent the total neglect of that part of scientific enquiry which has no immediate practical bearings. This is even fortunate for the success of the practical applications of science since many of these are rooted in earlier observations directed by scientific curiosity and not by the incentive of practical results. Few scientific discoveries of recent times have had the immense practical results of bacteriology. Yet this grew out of the theoretical curiosity of Leeuwenhoek about the small objects he could see with his microscope, the less unpractical enquiry of Pasteur into the causes of putrefaction, and the totally unpractical enthusiasm of microscopists of the last century for improving their objectives so that they might resolve the markings on diatoms. Nor is it likely that wireless transmission would have attained its present success if Clerk Maxwell had not had the unpractical impulse to work out the implications of an electro-magnetic theory of light.

While social forces thus tend to direct scientific enquiry into channels not too remote from the practical end of

controlling the outside world, it very generally happens that the scientist himself is much more interested in the theoretical bearing of his investigations. We are justified, therefore, in making a distinction between the *inventor*, whose interests are mainly practical, to whom increased control of the environment is the dominating incentive to activity, and the *scientist*, who is dominated by curiosity and whose main incentive to activity is unexplained phenomena in the external world. These pass into each other in insensible gradations. Leonardo da Vinci was, for example, both scientist and inventor; Leibnitz, whose main interests were in science and philosophy, also invented a vessel to sail on land.

I shall take as my type of pure scientist one who had very little of the inventor in his constitution—Charles Darwin. Darwin is a good illustration of the scientist, for he certainly had in a very dominant form the scientifically enquiring type of mind, he made great advances in more than one kind of science, and he had as the central achievement of his life the formation of a scientific hypothesis which was a fairly complete whole and had important general bearings.

One strikes a point of similarity between artistic and scientific activity in the fact that both give an ideal satisfaction to the tendency of constructiveness. The finished work of art and the finished scientific hypothesis are alike things in which their originators feel satisfaction as constructions of their own minds and towards which they take much the same attitude as we do towards a box or table we have ourselves made. They satisfy the drive to construction on the ideal plane. Indeed, the difference between the mere curiosity of a child and the developed curiosity of the scientist is that the scientist is no longer interested in isolated facts, but in the grouping of these into general conclusions.

Darwin, for example, tells of his surprise when he was 22 years of age that Sedgwick was not delighted when

it was suggested that a tropical Volute shell had been found in an old gravel pit belonging to the glacial period. Sedgwick remarked that if it had really been embedded there, it would be the greatest misfortune to geology, as it would overthrow all that was known of the superficial deposits of the midland counties. Darwin writes: "I was then utterly astonished at Sedgwick not being delighted at so wonderful a fact as a tropical shell being found near the surface in the middle of England. Nothing before had ever made me thoroughly realise, though I had read various scientific books, that science consists of grouping facts so that general laws or conclusions may be drawn from them."<sup>88</sup> So, at the age of 22, Darwin had not yet passed beyond the disorganised curiosity of the child to the organised curiosity of the scientist (which is concerned not with the mere bringing out of new particular facts, but of organising those facts under general laws).

Later in his life, after he had constructed his theory of natural selection, the stability of this theory was more important to him than could have been a mere isolated incident like the finding of the shell at an unexpected level. He describes with a delightful frankness his emotional reaction to his own doubts of the theory in a letter written in April of 1860. ". . . I remember well the time when the thought of the eye made me cold all over, but I have got over this stage of the complaint, and now merely trifling particulars of structure often make me very uncomfortable. The sight of a feather in a peacock's tail, whenever I gaze at it, makes me sick! . . ."<sup>88</sup>

Another incentive to scientific investigation is personal ambition. This is, of course, a motive common to all persons, but it is important to notice it shortly because it probably explains why scientific investigation rarely transgresses very far the limits of what is popularly approved, and why it generally follows lines of practical utility. The scientist's own curiosity may lead him far from practical utility, but the approbation of his fellow

men will only come if his line of research is not too remote from the interests of daily life. Even as unambitious a worker as Charles Darwin mentioned the strength of his desire for fame.\*

This, however, is an incentive which is by no means peculiar to the scientist. Of more individual characters of the successful scientist we must distinguish, in addition to unusual strength of curiosity, also an unusually high degree of general intelligence. This is the character which distinguishes the true scientific discoverer from the large number of persons who have strongly developed curiosity, but insufficient general intelligence for it to be usefully employed. We may take as an example such a person as James Smith, who spent a great part of his life in investigating the value of  $\pi$ .<sup>86</sup> By measuring in various ways the relationship between the area of a circle and its radius he maintained that  $\pi$  was exactly three and one-eighth, and maintained this view against all the eminent mathematicians of his day.

Richness of imagination is another character which strikes us when we read the biographies of distinguished scientists. It is said of Charles Darwin that "it was as though he were charged with theorising power ready to flow into any channel on the slightest disturbance, so that no fact, however small, could avoid releasing a stream of theory, and thus the fact became magnified into importance. In this way it naturally happened that many untenable theories occurred to him . . . and so it happened that he was willing to test what would seem to most people

\* Although Darwin frankly admitted his desire for fame as one of the incentives to his scientific work, he is an example of a scientist from whom the crude forms of self-assertion were strikingly absent. His generous acknowledgment of Wallace's part in putting forward the theory of natural selection, and his refusal to enter into controversy with those who criticised him (often with great bitterness and unfairness), is in striking contrast to the acrimonious disputes about priority which occurred in the lives of many scientific discoverers (as, for example, Newton).

not at all worth testing. These rather wild trials he called 'fool's experiments,' and enjoyed extremely."<sup>88</sup>

Poincaré describes how much of his discovery seemed to come by way of sudden illumination, which he ascribes to fruitful unconscious work following his conscious activity, and describes how some of his mathematical discoveries were made in this way.<sup>103</sup>

Francis Galton showed similar fertility of ideas, though much less under the domination of one central idea than either Darwin or Poincaré.<sup>85</sup> He experimented on every possible occasion. He made "composite photographs" by combining photographs of different people so as to retain the characteristics common to all, while eliminating the individual ones. He tried unsuccessfully to get photographs showing individual characteristics without the general ones by combining the negative photograph of one person with the positive photograph of another. He tried the effect of making his breathing volitional instead of semi-automatic by attending to each breath. He tried to enter into the feelings of a paranoiac by imagining that everyone he met in a walk in London was a spy. He tried to enter into the feelings of an idolater by developing a religious attitude towards the figure of Punch. He measured the degree of boredom of people in an audience at a lecture by noting the number of times they fidgeted per minute.

Galton's guiding hypothesis (which has now by many persons been built into a system in which it takes a place somewhat resembling that of a religious dogma) was that *nature* is a much more important factor in producing individual differences than *nurture*, but his fertile brain led him into much experimentation that had no connection with this central hypothesis. His work is, therefore, a somewhat disorganised body of contributions to science.

Fertile imagination and active theorising are, however, of no particular value unless they are accompanied by the power of self-criticism. This power is in most persons



largely automatic, *i.e.* wild hypotheses do not enter into consciousness at all. When we say that Darwin, Galton, etc., have fertile imaginations, we mean partly that this automatic functioning of the inhibition of unfamiliar or improbable suppositions is not very strong.\* It is necessary, therefore, that such persons should have a technique of self-criticism in order to do the weeding out of hypotheses which would otherwise be done automatically.

Darwin describes his own method of making his self-criticism of his theories as rigid as possible. "I had, also, during many years followed a golden rule, namely, that whenever a published fact, a new observation or thought came across me, which was opposed to my general results, to make a memorandum of it without fail and at once; for I had found by experience that such facts and thoughts were far more apt to escape from the memory than favourable ones. Owing to this habit, very few objections were raised against my views which I had not at least noticed and attempted to answer."<sup>58</sup>

Probably, like the artist, the scientist can only do really productive work when he has mastered a technique of scientific investigation which is different in every science. The card index of the anthropologist, and the experimental techniques of the physicist, physiologist, or experimental psychologist are examples of the methods of work which the scientific investigator must master. Without mastery of such methods, careful observation, high intelligence, fertility of imagination, and rigid self-criticism would all be inadequate to secure valuable scientific results.

\* A characteristic method of utilising to the full this richness of hypothesis without allowing it to be impeded by the automatic action of self-criticism, resulted from Darwin's discovery that he wrote best if he began by writing a rough copy straight off without the slightest attention to style. He found himself unable to write with sufficient want of care if he used his best paper, and therefore he wrote on the backs of old proofs or manuscripts. The self-criticism came afterwards when he was going over this rough draft, and making a fair copy from it.

## 2. Scientific Theory and Religion

On another side, the constructions of scientific theory have a relation to the attitudes towards the world as a whole, of which we will take religion as a principal example, for a scientific hypothesis may embody a thought-out attitude towards the world. Mrs. Rhys Davids has pointed out the similarity, for example, between the attitude of primitive Buddhism and the attitude towards the world resulting from an acceptance of the universality of rigid chains of cause and effect suggested by the physical sciences.<sup>200</sup> A modern expression of an attitude dictated by the physical sciences (remarkably similar in many respects to Hinayana Buddhism) is embodied in Bertrand Russell's *A Free Man's Worship*.<sup>208</sup>

This integration of his hypotheses with his attitude to the world as a whole provides an additional reason for the scientist holding his hypotheses firmly, and resenting questioning of them, for they may embody an attitude which has to him the practical and emotional significance of a religion. The difficulty which many of Darwin's contemporaries found in accepting his doctrine of natural selection was that it came in conflict with the doctrines which were already embodied in their religious attitude. Since his time, many theologians have built up a new attitude towards the world as a whole, embodying the ideas of evolution, progress, and so on. This doctrine is now a part of, instead of being alien to, the body of beliefs around which their religious adjustments are built.

## 3. Religion as a Mode of Adaptation

The thing in life contrasting most sharply with the religious attitude is probably the attitude of living unreflectively in the present, being happy over present pleasures, screaming at present pain, frightened at present dangers, and neither brooding over death or misfortune in the

remote future nor feeling need for hope of future happiness, or for a theory of the world-process as a whole. This is presumably the way in which all animals lower than man live; it is the only way possible before the powers of imagery and reflective thought are developed. In this condition neither religion nor anything corresponding to it is necessary or possible.

In sharp contrast with the above attitude are those more or less deliberate adjustments by thought and by feeling to the world as a whole, of which *religion* is typical. The attitude of living merely in the present is one which becomes inadequate as increasing self-consciousness and power of reflection make thoughts of the future, and of other parts of the world-process than that immediately present, become sufficiently real and charged with sufficient power over our happiness for it to be necessary to adopt some attitude towards them.

The legend of the beginning of the reflective life of Gautama Buddha is the story of the passage of man from the attitude of living in the present to the realisation of the necessity for adopting some attitude towards the world as a whole. It will be remembered that Gautama is supposed to have spent the early part of his life living happily in a palace protected from contact with all external things which could have forced on his attention the reflective attitude. Then, when outside one day, he met with a miserable beggar, an old man, a corpse, and a holy hermit, and he realised that, however protected his present life might be, the end of it would be misery, old age, and death. Misery, old age, and death had become, through this contact, realities to him such that he could be satisfied with no attitude towards life which did not take them into account. So he left his palace and his later history is the story of how he made his adjustment.

Probably we see a pathetic record of the first dawning of this realisation in the minds of primitive man in the ochre-covered bodies of his buried corpses. Once they are

realised, these emotionally disturbing elements in life (which make a simple adjustment to the present impossible) are met by adopting some attitude towards the world and towards the process of life as a whole. The adjustment in thought may be by phantastic legends of the cosmic process, or by metaphysical or ethical theories. On the emotional side it may be joyful acquiescence, angry rebellion, or indifferent acceptance. On the practical or behaviour side, it is some such course of behaviour as a systematised religious cult or action in accordance with some moral theory.

Every mode of adjustment has these three aspects of *thought*, *emotional attitude*, and *practice*, which are inter-dependent. Primitive Buddhism, for example (which was a non-religious mode of adjustment), had on its thought side a belief in the universality and rigidity of the law of cause and effect, and the impermanence of all things; on its emotional side, it developed contentment and serenity of mind; and, on its practical side, taught the destruction of desire, the attainment of enlightenment by meditation, and the systematic following of general kindness and right conduct.

Religion is one such attitude towards the universe as a whole. Some would say that religion is any attitude towards the universe as a whole, but this is to define religion so broadly as to destroy the value of the word. Religion is one kind of adjustment, one which has, as an essential element, a world of forces or beings which is not the natural world around us and which we may call a "spiritual world." If an individual believes in such a spiritual world and adapts part of his behaviour at least to its requirements, he is adopting a religious attitude.

At one time I defined religion as "a felt practical relationship with what are believed in as a superhuman being or beings."<sup>243</sup> Such definitions as this have been criticised on various grounds. The fact that it would exclude the atheistic Buddhism of the Hinayana tradition

(which is also probably the primitive form of Buddhism) is not important. Whether we are to define religion so widely as to include primitive Buddhism or more narrowly to exclude it is merely a verbal question of how we are to use the word "religion." I think we shall be nearer to a generally accepted use of the word if we say that the Buddha's teaching was a non-religious system of practical psychology. He taught that we can be saved not by turning to any God, but by understanding and controlling our own mental processes.

More serious is the consideration (argued with especial force by J. D. Unwin<sup>255</sup>) that the supernatural beings of primitive religions may often be artefacts of the investigator, due to his tendency to give definiteness to primitive conceptions which are really vague and to express them in the definite and personal terms which belong to the thought of the investigator. It is possible, therefore, that when, in descriptions of primitive religions, we find such a term as "spirit," the meaning would be better expressed by a vague and impersonal term such as "power." Since such powers, however, are certainly supernatural (they do not belong to the visible and tangible world), these conceptually vaguer forms of religion can be included by substituting "supernatural being or beings or powers" for the last four words of the above definition.

There is danger in speaking of religion as a mode of adaptation to the universe as a whole, and of forgetting that this adjustment is not, in fact, carried out by a single individual. It is an adjustment carried out under the influence of his fellow-men, and the religious individual takes over in great measure his beliefs, his ritual behaviour, and his religious ways of feeling from an organised group of other people. In other words, religion is in great part a social phenomenon: its beliefs are social beliefs and its rites consist in individuals taking part in social ceremonies. This is the side of religion which is specially stressed by

the school of French sociologists of whom the best known exponent is Lévy-Bruhl.<sup>143</sup>

This is not, however, the whole truth about religion. One of the most striking features of the development of religion is its passage from the purely social form of adjustment to an adjustment of the individual. The most individual form of religion is, nevertheless, still an adjustment that takes place in a social environment, and this environment cannot be neglected in dealing with the individual's religion, but it becomes progressively less important. In the most developed religions the emphasis is shifted from the relationship of a social group to its God, to the relationship of an individual to his God. We cannot, therefore, be content with the French sociologists to describe religion as merely "un fait social."

#### 4. The Essential Problems of the Psychology of Religion

The psychological problems of religion are two: one belonging to general psychology, the other to individual psychology. The problem of general psychology is to investigate the mental origins of the religious mode of adjustment as it is found in the average religious person; and the problem in individual psychology is the question of the origin in innate constitution and environmental circumstances of the individual differences in the religious adjustment—why, even under the same social influences, one person is strongly religious and another irreligious, and why one finds his spiritual home in one form of religion, while another finds it in another form of religion.

Leuba has pointed out the insufficiency of any definition of religion which describes it as merely a system of intellectual opinions, or as merely a system of ways of feeling, or as merely a system of ways of behaviour.<sup>142</sup> It is all three of these things together.

Every religion has a systematised body of beliefs (its *dogma*); a system of emotional reactions to the objects of

these beliefs; and its system of ways of behaviour (the *religious rite*). All three of these are organically connected together. Religious dogma is not merely a set of intellectual propositions; it is also a statement of the possibility of religious ways of feeling and of the effectiveness of religious modes of behaviour, and it cannot be understood properly unless considered in conjunction with these ways of feeling and behaving. What we have to give an account of in our psychology of religion is, therefore, religious dogma, religious feeling, and religious rites. No one of these can be treated adequately apart from the others. We have already seen that in the individual's religion, his beliefs and rites are largely taken over (by the process of group-suggestion) from his social environment. If all of his religious attitude were taken over in this way without any reaction on it of his own personality, we should be justified in saying that religion is merely a social product.

This, however, is not the full story of the development of the religious sentiment in the individual. The body of beliefs he takes over from his social environment will be acted on by his own intellectual processes; he will reason about them and criticise them, and will be unable finally to find a satisfactory adjustment for his own problems in a system of beliefs which he cannot justify intellectually.\* And, moreover, the individual's own emotional experiences make an individual contribution to his religious beliefs. The emotional experiences which have a bearing on religion are, for example, those of conversion, the sense of penitence and forgiveness, and of the felt presence of God in prayer and sacrament. These unquestionably play a large part in the building up of most persons' religious sentiments.

\* It is true, of course, that his intellectual criticisms will often be *rationalisations* of his emotional needs, but I see no reason to doubt that there is such a thing as intellectual criticism apart from rationalisation, and that this criticism is operative in any intelligent person's acceptance or rejection of a body of opinion supplied to him by his social environment.

In fact, we may say that, at adolescence, the body of religious beliefs, feelings, and behaviour, which have been socially received in childhood, are subjected to the impact of the individual's own intellectual criticisms and his own emotional needs; and this system is accepted and modified or totally rejected according to how far it satisfies the requirements of these influences. The religious adjustment, therefore, is made up, not only of a traditional element, but also of what we may call an *experiential* element, and a *rational* element.

It has sometimes been maintained that men have a specific religious instinct. Even though we may agree that distinctively human kinds of behaviour and thought may be based on innate drives, it is plainly very improbable that there should be a specific innate drive towards behaviour which man shares with no animal. A more reasonable explanation of religion in terms of human instincts (or propensities) would be that the energy of primitive drives with various biological ends may be *deflected* into the religious channel.\* That not one but many different drives may contribute energy to religious life and behaviour is suggested by the fact that the ascetic practices of those training themselves to lead the most intense religious life included suppression of the primitive modes of expression of a variety of behaviour tendencies. The sex tendency was suppressed in chastity; the assertive tendency in meekness; and the primitive comradeship tendency in voluntarily accepted solitude.

That religious behaviour is by no means independent of the sex drive is shown by many observations. The commonness of phallic and other sexual symbols in many primitive rites is often adduced as evidence by those who claim that religion is solely based on sexuality, but it is probable that they are not relevant since these symbols are probably connected with the practical aim of securing magical control of animal fertility in pastoral communities,

\* Cf. chap VIII.



although they sometimes have also uses in connection with human fertility. More important is Starbuck's observation of the connection in time between puberty and conversion.<sup>228</sup> Many of the phenomena of mysticism seem also to be sexually conditioned, and to be necessarily preceded by sexual deprivation. Certain wild theories of the dependence of religion on sexuality were severely condemned by William James.<sup>115</sup> A temperate and reasonable account of the relationship between religion and sex is to be found in the work of Flournoy.<sup>78</sup> More recently Freud has derived religion from the "Oedipus complex" which is a sexual interpretation of the relationship of a child to its parents.<sup>81</sup>

Bovet has also put forward a theory of the development of religion from a child's relationship to its parents although he is not guilty of the fallacy of attributing religion to a single origin.<sup>80</sup> He has also described the deflection of the tendency to pugnacity into religious channels (of which he finds examples in the Salvation Army and in the foundation of the Society of Jesus).<sup>29</sup>

## 5. The Individual Psychology of Religion

The general theory of the psychology of religion is in a more advanced condition than is our knowledge of the origin of individual differences in religious adjustment amongst people from the same social environment. This problem has been studied much more fully in the more abnormal religious developments of the mystics than it has in the development of ordinary religious persons. For this study there is much valuable material in the recorded lives of the mystics and in such careful studies of individual mystics as those of Baron F. von Hügel<sup>281</sup> and Delacroix.<sup>63</sup> It is clear that the initial impetus towards the mystical life may often be provided by a peculiarly severe deprivation, such as the failure to find happiness in love. A certain amount of mental instability is probably

also a determining factor; the general nature of the mentality of a person who becomes a mystic is certainly related to that of a person who becomes a psycho-neurotic.

On the more important question of what constitutes individual religious differences amongst normal persons, no work of comparable completeness has been done. The most hopeful suggestion comes from the psycho-analysts' suggestion that the child's attitude towards his parents is the framework on which is later modelled his attitude towards God. The father, for example, who drives his son to rebellion by over-great severity, may lay the foundation for an adult attitude of rebellion against God and against the world-process as a whole, while the child who is cowed into submission by similar parental severity will find the most satisfactory conception of God one in which He is regarded as a severe lawgiver.

There has, however, been much more speculation along these lines than precise study. No attempt has, so far as I know, yet been made to obtain statistical information on which to base a correlation between childhood attitude to the parent, and adult attitude to God. Until such statistical information is obtained, such theories remain unproved speculation.

## **6. Religion and other Modes of Adaptation**

It is a view commonly put forward that the mode of adjustment to the world must develop from the old adjustment based on a belief in a supernatural system to one of ethical principles with no supernatural background. The moral principles of religion are regarded as essential to a harmonious existence in the world, and these moral principles have only been accepted in the past in their religious setting. Now we are supposed to have advanced to a stage in which this setting is no longer necessary or possible. We must abandon the religious sanction of morality (understanding supernaturalism as

merely a symbol adapted to a primitive stage of thought) while clinging to the this-world behaviour system which is enshrined. This is, for example, the essence of the contention of C. G. Jung with respect to the relationship between religion and morality.<sup>122</sup> It is a suggestion that the religious adjustment is obsolete, but that a mode of adjustment must still be found which shall be as serviceable practically as the old one.

This is no new problem. There have been in the past many attempts to furnish non-supernatural world adaptations which have outwardly borne a more or less close relationship to the old religious practices which they were supposed to supersede. The worship of Reason during the French revolution, the Positivism of Comte, and the modern ethical churches are all examples of such substitutes for religion. Probably the most remarkable of these, historically, was the system of Gautama Buddha. In the Sutta on the Three Vedas he scoffs at those who make central in their religion the attempt to ascend to Brahma in ecstasy.<sup>278</sup> The later exaltation of this essentially anti-religious teacher to a position in the Godhead worshipped by the greater number of the millions of modern Buddhists is an illustration of the incurable preference of most men for the religious adjustment.

Religious institutions have, no doubt, in the past, been the principal social unifying forces. There is probably a still earlier stage to be found amongst primitive people (such as the Melanesians) where religious ways of behaving are not so much themselves separate social integrating forces as inseparably bound up with all other customary modes of behaviour which unify the group. In either case, deviations from socially accepted religious beliefs and modes of behaviour are socially disruptive forces and heresy has, therefore, in the past been punished with death.

At the present time, there is a common opinion that religious orthodoxy and membership of religious groups

is declining in civilised communities. There is also empirical evidence that this is the case.<sup>248</sup> It is true that new religious groupings have appeared and have won large numbers of adherents. Some of these are only loosely connected with Christianity (such as Christian Science, Spiritualism, Theosophy, and Anthroposophy). Recent movements more closely following the main Christian tradition are the Oxford Group Movement of Dr. Buchman, and various "fundamentalist" movements of which the most striking in this country is the Elim Four-square Gospel movement of Principal Jeffreys. While these movements have won adherents in considerable numbers, their success is not so great as to counteract the general tendency of religious institutions to decline.

The truth seems to be that religious institutions for various reasons have ceased to be important social integrating forces. Similarly, religious differences are ceasing to be important segregating forces. It naturally follows from this that religious deviations cease to be socially disruptive and therefore are now tolerated. To various degrees in different countries, political affiliations have become the sources of integrating and segregating forces. Fascism in Germany and Italy and Communism in Russia play the part in social integration which was once played by religious institutions, and for that reason call up the responses of fanatical faith and intolerance of heresy which were once characteristic of religious bodies.

## BOOK REFERENCES

*(Foreign works which have been translated into English are referred to in their English translations only.)*

1. Abraham, K., "Restrictions and Transformations of Scotophilia in Psychoneurotics," *Selected Papers on Psychoanalysis*, London, 1927.
2. Adams, D. K., "Experimental Study of Adaptive Behaviour in Cats," *Comp. Psych. Monog.* V. Baltimore, 1929.
3. Adler, A., *The Practice and Theory of Individual Psychology*. (Eng. trans.), London, 1924.
4. Alexander, W. P., "Intelligence, Concrete and Abstract," *Brit. Jour. of Psych., Monog. Supp.* XIX., 1935.
5. Allport, F. H., *Social Psychology*. Cambridge (Mass.), 1924.
6. Allport, G. W., "Attitudes," *A Handbook of Social Psychology*, Worcester (Mass.), 1935, pp. 798-844.
7. Alverdes, Fr., *Social Life in the Animal World*, London, 1927.
8. Antoninus, Marcus Aurelius, *Meditations*. (Eng. trans.), London, 1891.
9. Aristotle, *The Poetics* (trans. by S. H. Butcher), London, 1895.
10. Aveling, F., *The Consciousness of the Universal*, London, 1912.
11. Bagley, W. C., *The Educative Process*, New York, 1905.
12. Bakke, E. W., *The Unemployed Man*, London, 1933.
13. Ballard, P. B., *Group Tests of Intelligence*, London, 1922.
14. Ballard, P. B., "The Limit of the Growth of Intelligence," *British Journal of Psychology*, Vol. XII, 1922, pp. 125-141.
15. Ballard, P. B., *The New Examiner*, London, 1924.
16. Bandler, S. W., *The Endocrines*, Philadelphia, 1921.
17. Bartlett, F. C., *Psychology and Primitive Culture*, Cambridge, 1923. See also 291.

- 18 Baud-Bovy, D., "Le Combat des Vaches dans les Alpes Valaisannes," *Archives de Psychologie*, II., Geneva, 1903, pp. 297-299.
19. Baudouin, C., *Suggestion and Autosuggestion*. (Eng trans.), London.
20. Bechterev, V. M., *General Principles of Human Reflexology*, London, 1933.
21. Benedict, Ruth, *Patterns of Culture*, London, 1935.
22. Bentham, J., *An Introduction to the Principles of Morals and Legislation* (new ed.), Oxford, 1879.
- Bentley, M., and Day, L. M., see 60.
23. Bergson, H., *Creative Evolution*. (Eng trans.), London, 1911.
24. Bergson, H., *Laughter*. (Eng. trans.), London, 1911.
25. Bernard, L. L., *An Introduction to Social Psychology*, London, 1927.
26. Betts, *The Distribution and Functions of Mental Imagery*, 1909.
27. Binet, A., and Simon, Th., *The Development of Intelligence in Children*. (Eng. trans.), New Jersey, 1916.
28. Bosanquet, B., *A History of Aesthetic*, London, 1892.
29. Bovet, P., *The Fighting Instinct* (Eng. trans.), London, 1923.
30. Bovet, P., *Le sentiment religieux et la psychologie de l'enfant*, Neuchâtel, 1925.
31. Bowley, A. L., and Burnett-Hurst, A. R., *Livelihood and Poverty*, London, 1915
32. Breed, F. S., "The Development of certain Instincts and Habits in Chicks," *Behaviour Monographs*, I., 1911, pp. 1-78.
33. Breed, F. S., "Maturation and Use in the Development of an Instinct," *Jour Animal Behaviour*, III., 1913, pp. 274-285.
34. Brierley, S. S., *An Introduction to Psychology*, London, 1921.
35. Broad, C. D., "Various Meanings of the Term 'Unconscious,'" *Proceedings of the Aristotelian Society*, Vol. XXIII. (N.S.), London, 1923
- 36 Brown, E. R., "II and James Smith," *Discovery*, May, 1924.
37. Brown, W., "Some Experimental Results in the Correlation of Mental Abilities," *British Journal of Psychology*, Vol. III, Cambridge, 1910, pp. 296-322
38. Brown, W., and Thomson, G. H., *Essentials of Mental Measurement*, Cambridge, 1921.
39. Bühler, Charlotte, *From Birth to Maturity*, London, 1935.

40. Bühler, C., and Hetzer, H, *Testing Children's Development from Birth to School Age*. (Eng. trans.), London, 1935.

41. Bullough, E., "The Perceptive Problem in the Aesthetic Appreciation of Single Colours," *British Journal of Psychology*, Vol. II., Cambridge, 1909, pp. 406-463.

42. Bullough, E., "The Perceptive Problem in the Aesthetic Appreciation of Simple Colour-Combinations," *British Journal of Psychology*, Vol. III., Cambridge, 1910, pp. 406-447.

43. Bullough, E., "Psychical Distance," *British Journal of Psychology*, Vol. V., 1913, pp. 87-118

44. Burnett, I., "An Experimental Investigation of Repetitive Work," *Journal of the National Institute of Industrial Psychology*, Vol. II., London, 1924.

Burnett-Hurst, A. R., see 31.

45. Burt, C., *Mental and Scholastic Tests*, London, 1922.

46. Burt, C., *The Young Delinquent*, London, 1925.

47. Cannon, W. B., *Bodily Changes in Pain, Hunger, Fear, and Rage*, New York, 1915.

48. Carey, N., "Factors in the Mental Processes of School Children," *British Journal of Psychology*, Vol. VII, 1915, pp 453-490.

49. Chapman, S. J., *Outlines of Political Economy*, London, 1911

50. Clay, H., *Economics for the General Reader*, London, 1918

51. Conn, J. C. M., and Dawson, S., "Effect of encephalitis lethargica on the intelligence of children," *Arch. Disease in Childhood*, 1926, I, pp. 357-368.

52. Conway, M., *The Crowd in Peace and War*, London, 1915

53. Coover, J. E., *Experiments in Psychical Research*, Leland Stanford Jun. Univ. Publns., *Psychical Research Monog.*, I., 1917.

54. Cott, H. B., "The Effectiveness of Protective Adaptation in the Hive-bee," *Proc. Zoo. Soc., London*, 1936, pp. 111-133.

55. Cox, J. W., *Mechanical Aptitude—its Existence, Nature and Measurement*, London, 1928

56. Dallenbach, K. M., and Jenkins, J. G., "Obliviscence during sleep and waking," *Amer. Jour. of Psych.* XXXV., 1924 pp. 605-612.

57. Darwin, Charles, *The Expression of the Emotions in Man and Animals*, London, 1873

58. Darwin, F., *The Life and Letters of Charles Darwin* (3 vols.), London, 1888.

59. Davenport, F. M., *Primitive Traits in Religious Revivals*, New York, 1905.

Dawson, S., and Conn, J. C. M., see 51.

60. Day, L. M., and Bentley, M., "A Note on Learning in Paramoecium," *Journal of Animal Behaviour*, 1911.
61. de Condillac, E. B., *Traité des Sensations*, Paris and London, 1754
62. Deane, W., *Fijian Society*, London, 1921.
63. Delacroix, H., *Études d'histoire et de psychologie du Mysticisme*, Paris, 1908.
64. Descartes, *Les Passions de l'Âme*, Amsterdam, 1650.
65. Dickenson, Z. C., *Economic Motives*, Harvard, 1922.
66. Doughty, C. M., *Travels in Arabia Deserta*, Cambridge, 1888.
67. Drever, J., *Instinct in Man*, Cambridge, 1917.
68. Duff, J. F., and Thomson, G. H., "The Social and Geographical Distribution of Intelligence in Northumberland," *British Journal of Psychology*, Vol. XIV., Cambridge, 1924.
69. Ebert and Meumann, "Über einige Grundfragen der Psychologie der Übungsphänomene im Berichte des Gedächtnisses," *Arch. f. ges. Psychol.*, Vol. IV., 1904.
70. El Koussy, A. A. H., "An Investigation into the Factors in Tests involving the Visual Perception of Space," *Brit. Jour. of Psych. Monog., Supp. XX.*, Cambridge, 1935
71. Ellis, Havelock, *The Sexual Impulse, etc.*, Philadelphia, 1908.
72. Fabre, J. H., *Insect Life*. (Eng. trans.), London, 1901.
73. Fabre, J. H., *The Wonders of Instinct*. (Eng. trans.), London, 1918.
74. Ferenczi, S., *Contributions to Psycho-analysis*. (Eng. trans.), Boston, 1916.
75. Fields, P. E., "Studies in Concept Formation," *Comparative Psychology Monographs*, IX., Baltimore, 1934.
76. Fisher, R. A., *Statistical Methods for Research Workers*, London, 1930 (revd. ed., 1934)
77. Florence, P. S., *The Economics of Fatigue and Unrest*, London, 1924
78. Flournoy, T., "Une Mystique Moderne," *Archives de Psychologie*, XV., Geneva, 1915.
79. Freud, S., *The Interpretation of Dreams*. (Eng. trans.), London, 1913.
80. Freud, S., *Wit and its relation to the Unconscious*. (Eng. trans.), London, 1916.
81. Freud, S., *Totem and Taboo*. (Eng. trans.), New York, 1918.



82. Freud, S., *Group Psychology and the Analysis of the Ego*. (Eng. trans.), London, 1922
83. Freud, S., *Introductory Lectures on Psycho-analysis* (Eng. trans.), London, 1922.
84. Galton, Francis, *Inquiries into Human Faculty and its development*, London, 1883 (reprinted in Everyman's Library, 1907).
85. Galton, Francis, *Memories of My Life*, London, 1909
86. Gaw, Frances, "A Study of Performance Tests," *British Journal of Psychology*, Vol. XV, Cambridge, 1925
87. Ginsberg, Morris, *The Psychology of Society*, London, 1921.
88. Gray, J. L., and Moshinsky, Pearl, "Ability and Opportunity in English Education," *Sociological Rev.*, XXVII., London, 1935, pp. 113-162.
89. Gray, P. L., and Marsden, R. E., "The Constancy of the Intelligence Quotient—Final Results," *Brit. Jour. of Psych.*, XVII., 1926, pp. 20-26.
90. Gregory, J. C., *The Nature of Laughter*, London, 1924.
91. Greig, J. Y. T., *The Psychology of Laughter and Comedy*, London, 1923.
92. Groos, Karl, *The Play of Animals*. (Eng. trans.), London, 1898.
93. Groos, K., *The Play of Man*. (Eng. trans.), London, 1901.
94. Hadfield, J. A., *Psychology and Morals*, London, 1923.
95. Hall, G. S., *Youth: its Education, Regimen and Hygiene*, London and New York, 1921.
96. Hart, B., and Spearman, C., "General Ability, its Existence and Nature," *British Journal of Psychology*, Vol. V., Cambridge, 1913.
97. Head, H., "Mental States in Visceral Disease," *Bram*, London, 1901.
98. Head, H. and others, *Studies in Neurology*, London, 1920.
99. Hearne, S., *Journey from Prince of Wales's Fort to the Northern Ocean*, Dublin, 1796.
100. Herrick, C. J., *An Introduction to Neurology*, Philadelphia, 1920.
101. Hobbes, *Leviathan*, London, 1651.
102. Hobhouse, L. T., *Mind in Evolution*, London, 1901.
103. Housman, A. E., *The Name and Nature of Poetry*, Cambridge, 1933.
104. Howard, H. E., *Territory in Bird Life*, London, 1920.

105. Hughes, A. G., "Jews and Gentiles," *Eugenics Review*, Vol XX, London, 1928.
106. Hume, D., *Essays and Treatises*, 2 vols (reprinted), Edinburgh, 1804
107. Hume, D., *A Treatise of Human Nature* (new ed), London, 1888.
108. Huxley, J. S., *Essays of a Biologist*, London, 1923.
109. Huxley, T. H., *Lessons in Elementary Physiology* (Revd. ed.), London, 1915.
110. Hyde, I. H., "Effects of Music upon Electrocardiograms and Blood Pressure," *Journal of Experimental Psychology*, Vol. VII, Lancaster Pa., 1924, pp. 213-224.
111. Inge, W. R., "Eugenics," *Edinburgh Review*, July, 1922.
112. Jaensch, E. R., *Eidetic Imagery*. (Eng. trans.), London, 1930.
113. James, W., *The Principles of Psychology* (2 vols), London, 1905.
114. James, W., *Pragmatism*, London, 1907.
115. James, W., *The Varieties of Religious Experience*, London, 1907.
116. James, W., "The Moral Equivalent of War," *Memories and Studies*, London, 1910.
117. Janet, P., *The Major Symptoms of Hysteria*, New York, 1903.
118. Javelle, E., *Alpine Memories* (Eng trans.), London, 1909  
Jenkins, J. G., and Dallenbach, K. M., see 56.
119. Jennings, H. S., "On the behaviour of fixed infusoria (*Stentor* and *Vorticella*), with special reference to the modifiability of protozoan reactions," *Amer. Jour. Physiol.*, VIII, 1902.
120. Jennings, H. S., *The Behaviour of Lower Organisms*, Washington, 1904.
121. Jung, C. G., *Collected Papers on Analytical Psychology*, London, 1917.
122. Jung, C. G., *The Psychology of the Unconscious*. (Eng trans.), London, 1917.
123. Jung, C. G., *Psychological Types*, London, 1923.
124. Kammerer, P., *The Inheritance of Acquired Characters*, 1924.
125. Katz, D., *The World of Colour*. (Eng trans.), London, 1935.
126. Keller, Helen, *The Story of My Life*, London, 1904

127. Kennedy, F., "The Practical Value of the June Downey Will—Temperament Tests," *Brit. Jour., Ed. Psych.*, IV, 1934, pp. 260-263.
128. Kindermann, H., *Lola*. (Eng. trans.), London, 1922.
129. Klein, Melanie, *The Psychoanalysis of Children*, London, 1932.
130. Koffka, K., "Perception: An Introduction to the Gestalt-Theorie," *Psychological Bulletin*, Albany, N.Y., 1922, pp. 531-585.
131. Koffka, K., *The Growth of the Mind*. (Eng. trans.), London, 1924.
132. Koffka, K., *Principles of Gestalt Psychology*, London, 1935.
133. Köhler, W., *The Mentality of Apes*, London, 1925  
See also 287.
134. Kretschmer, E., *Physique and Character*. (Eng. trans.), London, 1925.
135. Kretschmer, E., *The Psychology of Men of Genius*. (Eng. trans.), London, 1931.
136. Lamarck, J. B. P. A., de M., *Histoire naturelle des animaux sans vertèbres*, 1815.
137. Lange, C., *Über Gemüthsbewegungen*, Leipzig, 1887.
138. Langley, J. N., "The Autonomic Nervous System," *Brain*, Vol. XXVI., London, 1903.
139. Lashley, K. S., "Nervous Mechanisms in Learning," *The Foundations of Experimental Psychology*, Worcester, Mass., 1929
140. Leakey, L. S. B., *Adam's Ancestors*, London, 1934.
141. LeBon, G., *The Crowd, a Study of the Popular Mind*. (Eng. trans.), London, 1920.
142. Leuba, J. H., *A Psychological Study of Religion*, New York, 1912.
143. Lévy-Bruhl, *Primitive Mentality*, London, 1923
144. Lewin, K., "Environmental Forces in Child Behaviour," *A Handbook of Child Psychology*, Worcester (Mass.), 1931, pp 94-127.
145. Lipps, Th., *Raumästhetik und geometrisch-optische Täuschungen*, Leipzig, 1897.
146. Loeb, J., *Comparative Physiology of the Brain*, London, 1901.
147. Loeb, J., *The Mechanistic Conception of Life*, Chicago, 1912.

148. Loeb, J., "Zur Theorie der physiologischen Licht und Schwerkraftwirkungen," *Arch f. d. ges Physiol*, Bd. 66.
149. Lowenfeld, Margaret, *Play in Childhood*, London, 1935.
150. Lyon, T. H., *The Attribute proper to Art. "Pure Art Value,"* London, 1921.
151. MacCurdy, J. T., *Problems in Dynamic Psychology*, Cambridge, 1923.
152. MacCurdy, J. T., *The Psychology of Emotion*, London, 1925.
- See also 292.
153. McDougall, W., *An Introduction to Social Psychology*, London, 1908.
154. McDougall, W., *Psychology—The Study of Behaviour*, London, 1920.
155. McDougall, W., *An Outline of Psychology*, London, 1923
156. McDougall, W., "An Experiment for the Testing of the Hypothesis of Lamarck," *Brit Jour. of Psych.*, XVII., Cambridge, 1927.
157. McDougall, W., "Second Report on a Lamarckian Experiment," *Brit Jour of Psych.*, XX., Cambridge, 1930.
158. McDougall, W., *The Energies of Men*, London, 1932.
159. MacDowell, E. C., "Experiments with rats on the Inheritance of Training," *Science*, 1924.
160. McIver, R.M., *Community*, London, 1920.
161. Mace, C. A., *Incentives some experimental studies*, London, 1935.
162. Malinowski, B., "Primitive Law and Order," *Nature*, Vol 117, Feb 6th, 1926.
163. Malinowski, B., *The Sexual Life of Savages*, London, 1932. See also 282 and 297.
- Marsden, R. E., and Gray, P. L., see 89
164. Marshall, A., *Principles of Economics* (Vol. I.), London, 1895.
- Meumann and Ebert, see 69.
165. Mill, James, *Analysis of the Phenomena of the Human Mind* (2 vols.), London, 1829
166. Moore, T. V., "Image and Meaning in Memory and Perception," *Psychological Monographs XXVII.*, Princeton, 1919
167. Moore, T. V., "The Correlation between Memory and Perception in the Presence of Diffuse Cortical Degeneration," *Psychological Monographs XXVII.*, Princeton, 1919.
168. Morgan, C. Lloyd, *Habit and Instinct*, London, 1896.
169. Morgan, C. Lloyd, *Animal Behaviour*, London, 1908.

170. Morgan, T. H., "Lamarckism," *Encyclopædia Britannica*, XIII. (14th ed.), London, 1929
- Moshinsky, Pearl, and Gray, J. L., see 88.
171. Muscio, B., *Lectures on Industrial Psychology*, Sydney, 1917.
172. Muscio, B., "Is a Fatigue Test Possible?" *British Journal of Psychology*, Vol. XII., Cambridge, 1922.
173. Myers, C. S., *Mind and Work*, London, 1920.
174. Myers, C. S., "The Evolution of Feeling," *The Australian Journal of Psychology and Philosophy*, Sydney, March, 1923.
175. Myers, C. S., "Individual Differences in Listening to Music," *British Journal of Psychology*, Vol. XIII., Cambridge, 1923.
176. Newman, E., *Wagner*, London, 1922.
177. Nicole, J. E., *Psychopathology*, London (2nd ed.), 1934.
178. Ogden, C. K., and Richards, I. A., *The Meaning of Meaning*, London, 1923.
179. Otto, R., *The Idea of the Holy*. (Eng. trans.), Oxford, 1923.
- Patterson, D. G., and Pintner, R., see 191.
180. Pavlov, I. P., "The Identity of Inhibition with Sleep and Hypnosis," *The Scientific Monthly*, Lancaster, Pa., Dec., 1923.
181. Pavlov, I. P., *Conditioned Reflexes*, Oxford, 1927.
182. Pear, T. H., *Remembering and Forgetting*, London, 1922
183. Pear, T. H., *Voice and Personality*, London, 1931.
184. Pearson, K., *Tables for Statisticians and Biometricians*, Part I, Cambridge, 1914
185. Peckham, G. W. and E. G., *On the Instincts and Habits of Solitary Wasps*, Madison, Wis., 1898.
186. Perry, W. J., *The Children of the Sun*, London, 1923.
187. Peterson, J., "Frequency and Recency Factors in Maze Learning by White Rats," *Journal of Animal Behaviour*, 1917.
188. Peterson, J., "Learning when Frequency and Recency Factors are Negative," *Journal of Experimental Psychology*, Vol. V., 1922
189. Piddington, R., *The Psychology of Laughter*, London, 1933.
190. Pike, O., "Instinct or Reason?" *Psyche*, II., London, 1921.

191. Pinard, J. W., "Tests of perseveration, I. Their relation to character," *Brit Jour. of Psych.*, XXIII., 1932, pp. 5-19.
192. Pintner, R., and Paterson, D. G., *A Scale of Performance Tests*, New York, 1917.
193. Poincaré, H., *Science and Method*. (Eng trans.), London.
194. Porteous, S. D., *The Psychology of a Primitive People*, New York, 1931.
195. Pratt, J. B., *The Religious Consciousness*, New York, 1920.
196. Price, J. St. C., "Negro-White Differences in General Intelligence," *Jour. of Negro. Educ.*, III., Washington, D.C., 1934, pp. 424-452.
197. Prince, Morton, *The Dissociation of a Personality*, New York, 1906.
198. Prince, Morton, *The Unconscious: The Fundamentals of Human Personality*, Boston, 1913.
199. Révész, Géza, "Experiments on Animal Space Perception," *British Journal of Psychology*, Vol. XIV., Cambridge, 1924.
200. Rhys Davids, C A F, *Buddhism*, London.
201. Ribot, Th, *The Psychology of the Emotions*.  
Richards, I. A., and Ogden, C. K., see 178.
202. Rivers, W. H. R., *Instinct and the Unconscious*, Cambridge, 1920.
203. Rivers, W. H. R., "Conservatism and Plasticity," *Folklore*, Vol. XXXII., London, 1921.
204. Rivers, W. H. R, "The Instinct of Acquisition," *Psyche*, Oct, 1921.
205. Rivers, W. H. R., *Psychology and Politics*, London, 1923.
206. Rivers, W. H. R., *Conflict and Dream*, London, 1923.
207. Rivers, W. H. R., *Social Organisation*, London, 1926.
208. Russell, B, *Philosophical Essays*, London, 1910.
209. Sandiford, P, *Educational Psychology*, London, 1928
210. Scott, W. E. D., "The Inheritance of Song," *Science*, XIX., 1904.
211. Scottish Council for Research in Education, *The Intelligence of Scottish Children*, London, 1933.
212. Seashore, C E., *The Psychology of Musical Talent*, Boston (Mass.), 1919.
213. Shand, A. F., *The Foundations of Character*, London, 1914.
- Sheard, N. M., and Wiesner, B. P., see 269.

214. Sherrington, C S , *The Integrative Action of the Nervous System*, London, 1906.
- 215 Sidgwick, A , *The Use of Words in Reasoning*, London, 1901.  
Simon, T., and Binet, A , see 27.
- 216 Sleight, W G , "Memory and Formal Training," *The British Journal of Psychology*, Vol. IV., 1912, pp 386-457.
217. Slocombe, C. S., "The constancy of 'g,' general intelligence," *Brit. Jour. of Psych* , XVII , 1926, pp. 93-110.
218. Smart, W., *An Introduction to the Theory of Value*, London, 1910.
219. Smith, E. M., *The Investigation of Mind in Animals*, Cambridge, 1915.
220. Spaeth, R A., *Industrial Education*, New York, 1920
221. Spalding, D. A., "Instinct—with original observations on young animals," *Macmillan's Magazine*, XXVII., London, 1873, pp. 282-293.
222. Spearman, C., "'General Intelligence' objectively determined and measured," *American Journal of Psychology*, XV., Worcester (Mass.), 1904.
- 223 Spearman, C., "Correlation calculated from faulty data," *Brit. Jour of Psych* , III., 1910, pp. 271-295.
224. Spearman, C., *The Nature of Intelligence and the Principles of Cognition*, London, 1923.
225. Spearman, C., "Recent Contributions to the Theory of 'Two Factors,'" and "Further note on the 'Theory of Two Factors,'" *British Journal of Psychology*, Vol. XIII., Cambridge, 1923.
226. Spearman, C., *The Abilities of Man*, London, 1927.  
Spearman, C., and Hart, B., see 96.
- 227 Spencer, H., "The Physiology of Laughter," *Essays*, Vol. II , London, 1901
228. Starbuck, *The Psychology of Religion*, New York, 1903.
229. Stephenson, W , "Tetrad differences for verbal subtests relative to non-verbal subtests," *Jour. of Educ. Psych.*, XXII , 1931.
230. Stephenson, W , "The Inverted Factor Technique," *Brit Jour. of Psych.*, XXVI., 1936, pp. 344-361.
231. Stout, G. F., *A Manual of Psychology*, Cambridge (3rd ed ), 1913.
232. Tarde, G., *Les Lois de l'Imitation*, Paris, 1904.
233. Tawney, R H , *The Acquisitive Society*.

234. Terman, L. M., *The Measurement of Intelligence*, London, 1919 (Boston, 1916).
235. Thomson, G. H., "A Hierarchy without a General Factor," *British Journal of Psychology*, Vol. VII, Cambridge, 1913 (followed by comments by Prof. Spearman)
236. Thomson, G. H., *Instinct, Intelligence and Character*, London, 1924.
237. Thomson, G. H., "On complete families of correlation-coefficients, and their tendency to zero tetrad differences: including a statement of the Sampling Theory of abilities," *Brit Jour. of Psych.*, Vol. XXVI., 1935, pp. 63-92
- Thomson, G. H., and Brown, W., see 38.
- Thomson, G. H., and Duff, see 68.
238. Thorndike, E. L., *Animal Intelligence*, New York, 1911 (reprint of articles published 1898 and 1901).
239. Thorndike, E. L., *Educational Psychology*, Vol. II., New York, 1913
240. Thorndike, E. L., "Mental Discipline in High School Studies," *Jour. of Ednl. Psych.*, XV., Baltimore, 1924, pp. 1-22 and 83-98.
241. Thorndike, E. L., *The Measurement of Intelligence*, New York, 1926.
242. Thorndike, E. L., and Woodworth, R. S., "The Influence of Improvement in one Mental Function upon the Efficiency of other Functions," *Psych. Rev.*, VIII., Princeton, 1901, pp. 247-261, 384-395 and 556-564
243. Thouless, R. H., *An Introduction to the Psychology of Religion*, Cambridge, 1923.
244. Thouless, R. H., "The Psychology of the Contemplative Life," *The Proceedings and Papers of the VIIth International Congress of Psychology*, Cambridge, 1924.
245. Thouless, R. H., "Phenomenal Regression to the 'Real' Object," I. and II., *Brit. Jour. of Psych.*, XXI., 1931, pp. 339-359, and XXII., 1932, pp. 1-30.
246. Thouless, R. H., "A Racial Difference in Perception," *Jour. of Social Psych.*, IV., 1933, pp. 330-339
247. Thouless, R. H., "The factorial Analysis of Human abilities," *The Human Factor*, 1935, pp. 358-361.
248. Thouless, R. H., "The changing character of organised religion: a study of the facts," *Hibbert Journal*, XXXIII, London, 1935.
249. Thouless, R. H., "Test Unreliability and Function Fluctuation," *Brit. Jour. of Psych.*, XXVI, 1936, pp. 325-343.



250. Thurstone, L. L., *The Vectors of Mind*, Chicago, 1935.
251. Titchener, E. B., *Lectures on the Experimental Psychology of the Thought-Processes*, New York, 1909.
252. Titchener, E. B., *A Beginner's Psychology*, New York, 1918.
253. Trotter, W., *Instincts of the Herd-in Peace and War*, London, 1916.
254. Unwin, J. D., *Sexual Regulations and Human Behaviour*, London, 1933.
255. Unwin, J. D., *Sex and Culture*, London, 1934.
256. Valentine, C. W., *The Experimental Psychology of Beauty*, London, 1913.
257. Varendonck, J., *The Psychology of Day-Dreams*, London, 1921.
258. Veblen, T., *The Instinct of Workmanship*, New York, 1922.
259. Vernon, P. E., "The Evaluation of the Matching Method," *The Journal of Educational Psychology*, Baltimore, 1936, pp. 1-17.
260. Vicari, E. M., "The Non-Inheritance of the effects of Training," *Science*, 1924.
261. von Hügel, F., *The Mystical Element of Religion* (2 vols.), London, 1908.
262. Wallas, Graham, *The Great Society*, London, 1914.
263. Ward, J., *Psychological Principles*, Cambridge, 1918.
264. Watson, J. B., "Recent experiments on how we lose and change our emotional equipment," *Psychologies of 1925*, Worcester (Mass), 1926.
265. Watson, J. B., *Psychology from the standpoint of a Behaviourist*, Philadelphia, 1919.
266. Weismann, A., *Essays upon Heredity and kindred Biological Problems*, London, 1889.
267. Westermarck, E., *The Origin and Development of the Moral Ideas* (2 vols), London, 1906.
268. Westermarck, E., *The History of Human Marriage*, London, 1921.
269. Wiesner, B. P., and Sheard, N. M., *Maternal Behaviour in the Rat*, London, 1934.
270. Wiggam, A. E., "The New Decalogue of Science," *The Century Magazine*, March, 1922.
271. Wilenski, R. H., *The Modern Movement in Art*, London, 1927.

272. Wingfield, A. H., *Twins and Orphans: the Inheritance of Intelligence*, London, 1928.
273. Woodworth, R. S., *Dynamic Psychology*, New York, 1918.  
Woodworth, R. S., and Thorndike, E. L., see 242.
274. Wyneken, "Die Militarisierung der deutschen Jugend," *Die Freie Schulgemeinde*, July, 1913.
275. Wynn-Jones, L., "Perseveration," *Rep. Brit. Assn.*, 1916.
276. Yerkes, R. M., and Yoakum, C. S., *Army mental tests*, New York, 1920. See also 283
277. Report of the Consultative Committee on *Psychological Tests of Educable Capacity and their possible use in the public system of Education*, Board of Education, London, 1924.
278. *Sacred Books of the East*. (Eng. trans. by Rhys Davids), Vol. XI., Oxford, 1881.
279. Kropotkin, P., *Mutual Aid*, London, 1902.
280. Ebbinghaus, H., *Über das Gedächtniss*, Leipzig, 1885.
281. Berkeley, G., *An Essay towards a New Theory of Vision*, 1709
282. Malinowski, B., *Crime and Custom in Savage Society*, London, 1926.
283. Yerkes, A. D., and Yerkes, R. M., *The Great Apes*, New Haven (Conn.), 1929.
284. Zuckerman, S., *The Social Life of Monkeys and Apes*, London, 1932.
285. Fuchs, W., "Untersuchungen über das Sehen der Hemianopiker und Hemiamblyopiker," I. and II., *Zeits f Psych.*, LXXXIV., pp 67-169 and LXXXVI., pp. 1-143, 1920.
286. Rubin, E., *Visuell wahrgenommene Figuren*, Copenhagen, 1921.
287. Köhler, W., *Gestalt Psychology*, London, 1930.
288. Crew, F. A. E., "A Repetition of McDougall's Lamarckian Experiment," *Jour. of Genetics*, XXXIII., Cambridge, 1936, pp. 61-101.
289. Tolman, E. C., *Purposive Behaviour in Animals and Men*, New York, 1932.
290. Mead, M., *Sex and Temperament*, London, 1935.
291. Bartlett, F. C., *Remembering*, Cambridge, 1932.
292. MacCurdy, J. T., *Common Principles in Psychology and Physiology*, Cambridge, 1928
293. Rubin, E., "Taste," *Brit. Jour. of Psych.*, XXVII., Cambridge, 1936, pp. 74-85

- 294 Homer Lane, *Talks to Parents and Teachers*, London, 1928.
- 295 Helmholtz, H., *Physiological Optics* (Eng. trans.), Menasha (Wis.), 1924.
- 296 Marx, K., *Capital* (Eng. trans.), London, 1887.
- 297 Malinowski, B., "The Psychology of Sex in Primitive Societies," *Psyche*, IV., London, 1923, pp 98-128.
- 298 Collins, Mary, "British norms for the Pressey cross-out test," *Brit. Jour. of Psych*, XVIII, 1928, pp. 121-133.
- 299 Bard, P., "Emotion. I The Neuro-humoral Basis of Emotional Reactions," *A Handbook of General and Experimental Psychology*, Worcester (Mass.), 1934, pp. 264-311.
- 300 Wundt, W., *An Introduction to Psychology* (Eng trans), London, 1912
- 301 Metzger, W., "Optische Untersuchungen am Ganzfeld. II. Zur Phänomenologie des homogenen Ganzfelds." *Psychologische Forschung*, XIII, 1930, pp 6-29
- 302 Hering, E., *Zur Lehre vom Lichtsinne*, Leipzig, 1872.
- 303 Burks, B., "The Relative Influence of Nature and Nurture upon Development," *27th Yearbook, N.S.S.E*, Pt I., pp 219-316.
- 304 Burt, C., *The Factors of the Mind*, London, 1940
- 305 Eastman, M., *Enjoyment of Laughter*, London, 1937.
- 306 Freeman, F. N., Holzinger, K. J., and Mitchell, B. C., "The Influence of Environment on the Intelligence, School Achievement, and Conduct of Foster Children," *27th Yearbook, N.S.S.E*, Pt. I., pp. 103-217.
- 307 Murphy, G., Murphy, L. B., and Newcomb, T. M., *Experimental Social Psychology*, New York and London, 1937
- 308 Newman, Freeman and Holzinger, *Twins a Study of Heredity and Environment*, Chicago, 1937

# INDEX

ABRAHAM, K., 478  
 Abstract sentiments, 99  
 — thinking, 260  
 Achievement tests, 426  
 Acquisitiveness, 124, 126, 174 ff., 386  
 ADAMS, D. K., 56  
 Adequate stimuli, 229  
 ADLER, 144, 196, 416 n.  
 Adolescence, 471, 491  
 Adrenalin, 85  
 Advertisement, 200, 379  
 Aesthetic reaction, 453, 462 ff.  
 Affect, 74, 226  
 Affective tone, 89  
 Affectivity, 437  
 Aggressiveness, 120, 136, 138, 144, 150, 184 ff., 197  
 Alcoholic beverages, 129, 375  
 ALEXANDER, W. P., 426  
 ALLPORT, 102, 104  
 Altruistic responses, 76 ff., 168  
 ALVERDES, 324  
 American army tests, 424, 442  
 Ammophila, 30, 31, 47  
 Amoeba, behaviour of, 22, 42, 242  
 Anal erotism, 178  
 Anecdotalism, 8 ff  
 Anger, 74, 85, 120, 133  
 Ansell Bourne, 116  
 Ant communities, 38, 189, 305  
 ANTONINUS, 300  
 Anxiety, 69, 127, 155  
 Apes, behaviour of, 55, 159, 168 n, 176, 216, 246, 252, 305  
 Appetite, 134  
*Arabia Deserta*, 193  
 ARAI, 222, 223  
 ARISTOTLE, 473  
 Art production, conditions of, 154, 454

Art, works of, 453  
 Asceticism, 153  
 Assertiveness, 83, 144, 315, 316  
 Association, principle of, 11, 58, 275 ff  
 Associationist psychology, 130, 256, 275 ff  
 Associationist-hedonist theory of action, 277 ff., 384  
 Associations and Communities, 324  
 Atomic theory, 279  
 Attenuation, 412  
 Attitudes, 101 ff., 157, 303  
 — expression of, in speech, 258, 265 ff.  
 Aufgabe, *see* Set, mental  
 Australian aborigines, 447  
 Autonomic nervous system, 85  
 Auto-suggestion, 309, 310  
 AVELING, 256, 259  
 Avoidance reaction, 69, 90, 98, 120, 224, 278  
 Awareness, 255  
 BABBLING, 258  
 Baboons, 38  
 BAGLEY, 451  
 BAKKE, 217  
 BARTLETT, F. C., 269, 315, 318  
 BAUD-BOVY, 185  
 Beauty, 452  
 Beauchamp, Miss, 115 ff  
 BECHTEREV, 59  
 Bees, behaviour of, 78, 175  
 Beethoven, 110  
 Behaviour, 225  
 Behavioural and geographical objects, 244  
 Behaviourism, 2 ff., 278  
 BENEDICT, RUTH, 196

- BENTHAM, 247, 356 n.  
 BERGSON, 31, 202  
 BERKELEY, 231 n.  
 BERTRAND RUSSELL, 485  
 BETTS, 250  
 BINET, 419, 423, 426, 430  
 Biological classification of instincts, 35 ff.  
 Birds, courtship of, 92  
 — mating of, 159  
 — parental behaviour of, 167  
 — song of, 32, 175  
 — territorial instincts of, 175, 176  
 Bismarck, 114  
 Blackburne, 251  
 Blind spot, 236  
 Blue-bottle fly, 46  
 — — larva of, 21  
 Boredom, 222 n.  
 BOSANQUET, 465  
 BOUTAN, 216  
 BOVET, 144, 149, 151, 187, 194, 492  
 BRADLEY, 280  
 Braque, 457, 460  
 Bravais-Pearson correlation formula, 407  
 BREED, 33, 34  
 BROAD, 140  
 Buchman, 495  
 Buddhism, 485, 487, 494  
 BÜHLER, CHARLOTTE, 220, 426  
 BULLOUGH, 462, 465, 474  
 BURT, 437  
 Burying beetle, 48  
 Business men, 354, 375  
 Byron, 468, 472  
  
 CANALISATION, 139  
 CANNON, 85, 88  
 CANTRIL, 104  
 Capacity and ability, 419  
 Caressing of children, 173  
 CAREY, 250  
 Caste, 337  
 CAVD, intelligence, 430  
 Cavendish, 478  
 Cerambyx, 27, 32, 33  
  
 Cerebrum, 43  
 Certainty, 285  
 Cézanne, 457, 460  
 Chain reflexes, 24 ff.  
 Character, 100, 107 ff., 112  
 — types of, 109 ff.  
 Chess, 151, 247, 251  
 Chi<sup>2</sup> method in statistics, 405  
 Chicks, feeding behaviour of, 33, 34, 52, 262  
 Civilisation, 148, 152, 156, 158, 216  
 CLARK HULL, 7  
 Class conflict, 343  
 Class-consciousness, 327, 343  
 Classes, social, 80, 152, 163, 324, 336 ff.  
 Classical art, 457  
 Claustrophobia, 72, 272  
 Clerk Maxwell, 479  
 Collecting, 177, 182, 376  
 Collins-Drever performance tests, 425  
 Colour sensations, 228, 231  
 Communal ownership, 178  
 Communism, 183, 495  
 Compensation, 273, 285  
 Competition, 195, 197, 199  
 Compound memory traces, 269 ff.  
 Comte, 494  
 Conation, 74  
 Concept function in animals, 262, 263  
 Conceptual thinking, 259 ff., 276  
 Conditioned reflex, 50, 58 ff., 70 ff.  
 CONDILLAC, 11  
 Configurations, 24, 458, 472  
 Conflict, mental, 282 ff.  
 — — and art, 468 ff., 473 ff.  
 — on the physiological level, 283  
 Consciousness, 225, 320  
 Conservation, 315, 317, 318  
 Conservatism, 318  
 Constancy effect, 232 ff., 241  
 — hypothesis, 230, 232, 235  
 Constructiveness, 315, 318  
 Contact, social, 258, 267  
 Contiguity, association by, 58, 276, 280

Contra-suggestion, 310  
 Control, mental, 291  
 Control groups, use of, 390 ff.  
 Controlled thinking, 273, 279  
 Conventions, social, 351  
 CONWAY, 317  
 Co-operative behaviour, 36, 304  
 Co-ordination, 43  
 COOVER, 404  
 Correlation, 149, 406 ff  
 COURT, 310  
 Courting behaviour, 92, 213  
 COX, 417, 437  
 Cramming, 427  
 Craving, 135, 359, 360 n., 365 n., 373  
 CREW, 62  
 Crime, 68, 70, 352 ff.  
 Crowd psychology, 78  
 Cruelty, 81  
 Crying of children, 69  
 Cues, sensory, 237  
 Culture, transmission of, 33, 120  
 Curiosity, 282, 477  
 Cutaneous sensibility, 227  
  
 DALTON, 28  
 Damara oxen, 315, 316  
 DARWIN, 36, 61, 83, 480 ff.  
 DAVENPORT, 156  
 DAY and BENTLEY, 53  
 Day-dreaming, *see* Phantasy  
 Death instincts, 143 n  
 Decline of intelligence level, 443  
 Definition, 15 ff  
 Deflection, 139, 141 ff., 386, 491  
 DELACROIX, 492  
 Delayed reaction, 252  
 Deliberation, 371, 373  
 Demand, 359  
 — Law of, 380  
 Dementia praecox, 109, 111, 177, 274, 311  
 Depth perception, 231, 241  
 DESCARTES, 27 n., 86, 298  
 Descriptive painting, 457  
 Desire, 358 ff  
 Deviations, behaviour, 166, 353  
 Diabolical possession, 117

DICKENSON, 144 n., 297, 299  
 Difference, significance of, 397 ff.  
 Diminishing utility, 372.  
 — valuation, 371 ff.  
 Discreteness and continuity, 260, 261  
 Disinterested emotions, 77 ff., 306  
 Displacement of affect, 75  
 Dispositions, mental, 20, 96  
 DISRAELI, 317  
 Dissociation of personality, 112, 115 ff.  
 Distance, psychical, 474  
 Dobus, 196  
 Doubt, 284  
 Dreams, 274 n  
 Drives, 133 ff., 141  
 Dynamic conceptions in psychology, 127, 130 ff.  
  
 EBBINGHAUS, 52, 67, 271  
 EBERT and MEUMANN, 449  
 Education, 60, 198, 219, 444 ff.  
 — systems of, 67, 213, 220  
 Educative mental processes, 280, 434  
 Effect, law of, 50, 52 ff., 68 ff.  
 Ego, 113, 117, 270 n., 288, 298, 303  
 Eidetic imagery, 250 ff  
 Emotion, 70, 74 ff., 96, 132, 202, 258  
 — expression of, 82, ff., 92  
 — function of, 93 ff.  
 — visceral accompaniments of, 83, 85 ff.  
 Emotion and instinct, 76, 92 ff  
 Empathy, 462  
 Encephalitis lethargica, 421  
 Endocrine glands, 70, 86, 106, 156  
 Endogamy, 162  
 Energy, mental, 128 ff., 202, 434  
 — physical, 128  
 Ergograph, 220  
 Eugenics, 60  
 Euglena, 21  
 Examinations, 427

Exercise, law of, 50 ff., 67  
 Exogamy, 162, 163  
 Experiment, 5, 390 ff.  
 Exploring, 189  
 Exteroceptive neurons, 227  
 Extroversion, III, 477  
 Eye, sensations of, 228, 230

FABRE, 27, 30, 31, 45 ff.  
 Facial expression, 83  
 Faculties, mental, 289, 429, 433,  
     436, 448  
 Faith, 285  
 Family, 38, 172, 324, 332  
 Famine, 153  
 Fantastic anecdotalism, 10 ff.  
 Fascism, 344, 495  
 Fashionable articles, value of,  
     381  
 Fasting, 153, 374  
 Fatigue, 90, 220 ff  
 Fear, 70 ff, 85, 93, 154 ff.  
 Fechner's Law, 377  
 Feeling, *see* Affect  
 Fetishism, 164  
 Feudal system, 329, 342  
 FIELDS, 263  
 Fighting amongst birds, 176, 180  
 — between children, 187  
 — between cows, 185, 316  
 — for female, 185, 188  
 Fijians, 125, 190  
 Filial behaviour, 169  
 Fishes, parental behaviour of, 169  
 FISHER, 401, 406, 408 n.  
 FLOURNOY, 492  
 Fluctuations of mental func-  
     tions, 413  
 Food habits as group distin-  
     guishing marks, 338  
 Forces, mental, 241  
 FOREL, 42  
 Forgetting, 271, 272  
 Form and content of works of  
     art, 204, 472  
 Formal training, 8, 410, 448 ff.  
 Free will, 301  
 Frequency and recency, laws of,  
     50

FREUD, 7, 38, 39, 100 n., 117,  
     126, 140, 141, 147, 155 n.,  
     162, 169 ff., 204 ff., 213,  
     272, 274, 286, 492  
 FUCHS, 236, 237 n.  
 Fugue, 116  
  
 GALTON, 248 ff, 254, 315, 316,  
     394 n., 416, 417, 420, 421,  
     483  
 Gautama Buddha, 486, 494  
 General ability, 14, 429 ff., 448,  
     469, 482  
 Generic ideas, 259 n.  
 Genius, 423 n.  
 GESELL, 426  
 Gestalt theory, 7, 12, 136, 239 ff.,  
     307  
 GRAHAM WALLAS, 144 n.  
 Gregariousness, 35, 175, 304 ff.  
 GREGORY, 207  
 GREIG, 207  
 GROOS, 184, 185, 212 ff., 258  
 Group-consciousness, 325 ff  
 Group distinguishing marks, 325  
 — factors, 429, 433 n, 436 ff.  
     440  
 — mind, 319 ff.  
 — tests of intelligence, 424  
 Groups, social, 244, 323  
 — — formation of, 324  
 — — hostility between, 328  
  
 HABIT, 40, 50, 267  
 — systems, 51, 69, 129, 152, 217,  
     299  
 HABECKEL, 214  
 HALL, STANLEY, 214  
 Hatred, 82 n, 169, 172  
 HEAD, 90, 227 n., 269  
 Head hunting, 192  
 HEARNE, 188  
 HELEN KELLER, 261  
 Hell, 156  
 HELMHOLTZ, 228, 230, 232, 234  
 Herd instinct, 304  
 HERING, 228  
 Hierarchical order, 433, 435

HIPPOCRATES, 105  
 Hoarding, 175  
 HOBBS, 168, 193, 304  
 HOBHOUSE, 56  
 HOLMES, 90  
 HOMER LANE, 355  
 Homosexuality, 142, 164, 165,  
     354, 452 n.  
 Hormic psychology, 131  
 Hormones, 86  
 HOUSMAN, 455, 466  
 HOWARD, 175, 176, 186  
 Humour, 201, 205  
 Hunger, 134, 135, 152 ff., 374  
 HUXLEY, ALDOUS, 302 n.  
 HUXLEY, J., 92  
 HUXLEY, T. H., 37  
 Hypnotism, 117, 308  
 Hysteria, 100 n., 111, 118, 286,  
     312

IBSEN, 329  
 Ideals, 248, 274, 275, 302  
 Idealsation, 150  
 Ideo-motor action, 296  
 Illusion, 234  
 Imageless thought, 226, 254 ff.,  
     259, 261, 270  
 Imagery, 81, 226, 246, 248 ff.,  
     259, 270, 417  
 Imagination, 268  
 Imitation, 306, 314  
 Impressionism, 455  
 Impulsive action, 288  
 Inbreeding, 162  
 Incentive, 125, 133, 215, 217 ff  
 Incest, 162  
 Individual psychology, 416 ff.  
   — valuation, 359, 368 ff.  
 Induction, social, 313  
 INGE, 442  
 Inheritance of acquired charac-  
   ters, 61 ff.  
   — — wealth, 338  
 Inhibition, 59, 60, 84, 284  
 Insight, 14, 55, 66  
 Instinctive behaviour of ani-  
   mals, 27 ff., 60, 61, 314  
 Instincts in man, 7, 41, 119 ff.

Institutions, social, 125, 317, 330  
 Integration, 114  
 Intelligence and instinct, 30,  
     40 ff., 49  
 Intelligence, growth of, 420, 441  
 Intelligence level, grades of, 422  
 Intelligence, nature of, 14 ff., 44,  
     418, 429 ff.  
 Intelligence quotient, 419 ff., 441  
   — tests, 105, 417, 419 ff.  
 Internationalism, 329  
 Interoceptive neurons, 229  
 Introspection, 257  
 Introversion, 111, 274, 477  
 Invention, 478  
 Inverted factor technique, 440  
 Iris, reflex adaptation of, 23  
 Isomorphism, principle of, 24

JAENSCH, 109, 111, 250 ff.  
 JAMES, WILLIAM, 8, 64, 86 ff.,  
     97, 98, 101, 109, 116, 119,  
     121, 144, 154, 243, 256,  
     295, 299, 382, 492  
 James-Lange theory of the  
   emotions, 10, 75 n., 86 ff.,  
     377  
 JANET, 115, 308  
 Jeffreys, Pastor, 495  
 JENNINGS, 21, 22, 52 n.  
*Julius Caesar*, 110  
 June Downey will-temperament  
   test, 414, 427

KAMMERER, 61  
 KANT, 347 n.  
 KATZ, 232  
   Kinaesthetic imagery, 254 n.  
 Kinship systems, 162, 318  
 KLEIN, MELANIE, 214  
 KOFFKA, 26, 56 n., 136, 137,  
     239 ff., 243, 244, 269, 270 n.  
 KÖHLER, 10, 55 ff., 230, 239 ff.,  
     246, 252, 272  
 KRETSCHMER, 109 ff  
 KROPOTKIN, 36, 304  
 KÜLPE, 9, 256  
 Kwakiutl, 196



- LAMARCK, 61  
 LANGE, 86  
 Language, 84, 120, 257 ff.  
 LASHLEY, 66 n  
 Laughter, 71, 201 ff.  
 — social functions of, 208 ff.  
 — varieties of, 203, 208, 210  
 Law, 157  
 Leaders, 309, 317, 327 n, 330 ff.  
 Learning, 49 ff, 65 ff., 276  
 LEBON, 78, 314  
 Leeuwenhoek, 479  
 LEIBNITZ, 480  
 Leisure, 218  
 Leonardo da Vinci, 480  
 LEUBA, 489  
 LÉVY BRUHL, 489  
 LEWIN, 136  
 LIPPS, 462  
 LLOYD MORGAN, 52, 262  
 LOEB, 21, 24, 25  
 Logic, 261  
 LOMBROSO, 352  
 Love, 86, 96 ff, 102, 142, 169  
 Loyalty, 327 ff, 381  
 Luxuries, 366  
 LYON, 465  
  
 MACCURDY, 270  
 MACE, 219  
 MALINOWSKI, 161, 172, 178, 267,  
 335  
 Manic-depressive insanity, 106  
 Manners, 333 ff.  
 Maoris, 125, 198  
 Marginal value, 371, 378  
 Market value, 378 ff  
 Marriage, 161  
 — by capture, 188  
 MARSHALL, 368, 385  
 MARX, 326, 345  
 Masai, 125  
 Masochism, 143, 150, 164  
 Matching method, 408  
 Maternal behaviour, 86, 120,  
 167, 277  
 Maturation, 35  
 MAYER, 110  
  
 McDougall, 7, 62, 76, 93, 96,  
 101, 102, 103, 119, 121,  
 122 ff., 137, 184, 203, 206,  
 210, 296, 297, 300, 313,  
 320, 351, 477  
 McIVER, 324  
 McNaughten ruling, 348  
 MEAD, MARGARET, 168  
 Meaning, 16, 230, 235, 255, 257,  
 264  
 Meaningless propositions, 18  
 Mechanical ability, 417, 437, 440  
 Mechanistic psychology, 131  
 Memory, 3, 8, 52, 65, 267 ff, 390,  
 430, 448  
 Mental age, 419, 420, 441  
 — deficiency, 422, 442, 445  
 — tests, 104, 416 ff  
 Meteorological charts, 237  
 METZGER, 241  
 MICHAEL ANGELO, 468  
 Middle classes, 321, 340  
 Migration of birds, 38, 305  
 Military drill, 312  
 MILL, JAMES, 10, 275 ff.  
 MILL, J S, 279  
 Mind, definition of, 320 n.  
 Misers, 177, 181, 375  
 Modes of appearance of colours,  
 232  
 Money, craving for, 177, 180 ff,  
 375  
 Monogamy, 139, 159, 160  
 Monotonous work, 218  
 Moods, 74, 133  
 MOORE, T. V., 255  
 Moorhens, nesting of, 46  
 Moral action, 287, 290  
 — sentiments, 346 ff.  
 MORTON PRINCE, 115 ff.  
 Motor mechanisms, 121  
 Mountaineering, 144 n.  
 Multiple factor analysis, 438 ff.  
 — personality, 115 ff.  
 MÜNSTERBURG, 417  
 Music, 458  
 Musical ability, tests of, 459  
 MYERS, C S., 91, 462, 463,  
 467  
 Mystics, 145, 492

NAPOLEON, 317, 320  
 Natural selection, theory of, 37,  
     61  
 Negative values, 359  
 Negativism, 311  
 Negroes, 341, 447  
 Nerve tracts, 23, 64, 66  
 Nervous system, 42  
 Nest building, 25, 35, 46  
 Neuraesthesia, 223  
 Neurotic fear, *see* Anxiety  
 Norm, test, 417  
 Northumberland mental tests,  
     424

OBJECTIFICATION, 149  
 Obliviscence, 271  
 Occupation and intelligence, 444  
 Oedipus complex, 12, 140, 169 ff.,  
     213, 492  
 OGDEN and RICHARDS, 264, 265  
 Optic thalamus, 90  
 Organisation of perceptual field,  
     239  
 Original and derivative art, 455,  
     468  
 Osmia, 45  
 Overlearning, 51  
 Ownership, 178, 182  
 Oxygen deprivation, 189  
 Oxytricha, 21

PACIFISM, 145, 194  
 Pain, 89, 227  
 Painting, 457  
 Pan-sexualism, 143  
 Paramecium, 53  
 Parental behaviour, 158, 167 ff.  
 Pasteur, 479  
 Partial correlation, 409 ff  
 Patriotism, 101, 102, 328  
 Pattern reactions, 20 ff., 120  
 Patterns of culture, 125, 183,  
     196 ff., 303, 341  
 PAVLOV, 27 n., 58 ff., 62, 391, 477  
 PECKHAM, Mr. and Mrs., 30, 31,  
     47  
 Pecking order of fowls, 316

*Pepys's Diary*, 335 n.  
 Percentile rank, 420  
 Perception, 17, 115, 230 ff.  
 Perceptual tests of intelligence,  
     437  
 Performance tests of intelligence,  
     425  
 PERRY, 190  
 Perseveration, 292, 414, 437  
 Persona, 114  
 Personality, 107, 112 ff.  
     — inventory, Bernreuter's, 428  
 Perspective, 457, 461  
 Perversion, sexual, 164 ff., 170  
 Phantasy, 165, 272 ff., 467, 472,  
     477  
 Phatic communion, 267  
 Phenomena, 115, 233, 242 ff.  
 Phenomenal regression, 233 n.,  
     461  
 Philosophy, 226  
 Phobias, 72  
 Physiological effects of art,  
     447 n., 466  
 Physiology, 66  
 Picture-completion test, 425  
 PIDDINGTON, 207  
 PIKE, 46  
 Pine processionary caterpillars,  
     30  
 Pintner-Paterson performance  
     tests, 425  
 Pituitary gland, 86, 135  
 Plasticity of response, 31, 40 ff.,  
     47, 94  
 PLATO, 275  
 Platonisation, 151  
 Play, 157, 211 ff., 258  
     — fighting, 149, 184 ff., 211  
     — phantasy, 214  
     — synthetic, 212  
 Pleasure and unpleasure, 89, 204,  
     226, 475  
 Poetry, 458  
 POINCARÉ, 483  
 Political attitudes, 170  
 Polygamy, 159, 160  
 Polymorphous perverse tenden-  
     cies, 170  
 Poverty, 354, 367

- Power, craving for, 196, 375, 381  
 Pre-nuptial sexual intercourse, 147, 160, 161  
 Pressey X-O tests, 438  
 Prestige, 194, 309  
 Price, 363 ff., 369, 380  
 Primary and secondary emotions, 76  
 — memory image, 250 n.  
 Primitive comradeship, 208, 315, 323, 334  
 Principles of conduct, 302  
 Probable error, 396 n  
 Promiscuous mating, 159  
 Propensities, McDougall's theory of, 122 ff., 298  
 Proprioceptive neurons, 229  
 Propaganda, methods of, 80  
 Proto-sexuality, 171  
 Psycho-analysis, 12, 69, 169 ff., 183 n., 214, 286, 472, 493  
 Psychogram, 108  
 Psychotherapy, 166  
 Psychology, definition of, 1  
 — scientific method in, 7 ff.  
 Psycho-neurosis, 117, 141, 161, 171, 196, 286, 469  
 Psychosis, 141  
 Pugnacity, *see* Aggressiveness  
 Punishment, 68, 215, 219, 349, 355 ff  
 Purposive behaviour, 25, 131
- QUANTITATIVE expression of desires, wants, etc., 361 ff.
- RACIAL differences in intelligence, 446  
 — groups, 163  
 Random sampling, 393  
 Rationalisation, 247, 490 n  
 Reaction time, 102, 400  
 Real properties of objects, 233, 242 ff.  
 Reality, sense of, 244  
 Reasoning tests, 425  
 Recapitulation theory of play, 213
- Reciprocal and non-reciprocal social obligations, 335  
 Recognition, 270  
 Redintegration, 280  
 Reflex, 23 ff  
 — definition of, 23, 27 n.  
 Reflex arc, 24  
 Reliability of tests, 411 ff  
 Relief, 206  
 Religion, 200, 288, 352, 485 ff  
 — definition of, 487  
 — mental origins of, 142, 145, 170, 491 ff.  
 — as a social phenomenon, 489  
 Repression, 100 n., 140, 141, 272  
 Reproductive system of tendencies, 35, 36, 158, 176  
 Research, social control of, 479  
 Responsibility, 348  
 RESTORFF, 272  
 Retrieving behaviour of rats, 86, 133, 135  
 Retroactive inhibition, 272  
 Reversible figures, 235  
 REYS DAVIDS, 485  
 RICHARDSON, 237 n.  
 RIVERS, 72, 93, 178, 227 n., 272, 287, 312, 313 n., 318  
 Robespierre, 110 n.  
 Romantic art, 457, 466  
 RUBIN, 235  
 Ruling class, 198, 338  
 Ruskin, 110 n.
- SADISM, 143, 164 ff., 171, 353, 357  
 Salvation Army, 146, 150, 492  
 Sampling, 391 ff.  
 — error, 392  
 — theory of ability, 435  
 Satiability of wants, 180, 376  
 SCHJELDERUP-EBBE, 316  
 SCHOPENHAUER, 452  
 Scientific investigation, 5, 477 ff.  
 — laws, 6  
 SCOTT, 32  
 Scratch reflex, 24  
 SEASHORE, 420, 459  
 Segregation, 163, 240, 323, 337

- Self, 115  
 Self-criticism, 484  
 Self-love, 101  
 Self-preservative system of tendencies, 35, 36, 176, 287  
 Self-regarding sentiment, 351  
 Senescence, 420  
 Sensation, 227 ff., 234, 238  
 Sense of humour, 209  
   — organs, 228  
 Sentiment, 96 ff., 303, 332  
 Sentimentalism, 101  
 Set, mental, 103, 255, 279  
 Sex, 40, 97 ff., 120, 126, 143, 158 ff., 286, 452, 491  
   — regulation and cultural achievement, 147 ff., 161  
 Shamanism, 117, 154  
 SHAND, 96, 100, 102  
 Shell shock, 287, 312  
 Shelley, 249, 468  
 SHERRINGTON, 23, 88, 283  
 Significance, estimate of, 396 ff  
 Similarity, association by, 276  
 Skill, 51, 60, 67  
 SLEIGHT, 8, 449  
 SMART, 369  
 Smell sensations, 228  
 Smith, James, 482  
 Social approval and disapproval, 347 ff.  
   — behaviour tendencies, 35 ff.  
   — constructiveness, 318  
   — co-ordination, 257  
   — determination of art production and appreciation, 454 ff  
   — determination of economic values, 388 ff.  
   — function of language, 264 ff.  
   — influence, 303, 308, 355  
   — psychology, 5, 9  
 Socialism, 343  
 Sociological implications of intelligence test results, 441 ff.  
 Somnambulism, 115, 116  
 Space, 243  
 SPALDING, 98  
 SPEARMAN, 280, 407 n., 412, 431 ff., 448 n.  
 Special schools for mental defectives, 445  
 Speculation in psychology, 11 ff  
 SPENCER, 201  
 Sphex, 45  
 Spontaneous instinct variability, 44 ff.  
 Sports, 131, 145  
   — dangerous, 157  
 Stability, social, 342 ff.  
 Standard deviation, 394, 395, 397, 420  
   — error, 395 ff.  
 Stanford revision of intelligence scale, 424, 426  
 STARBUCK, 492  
 Statistical methods, 67, 392 ff., 448  
 Stentor, reactions of, 22  
 STEPHENSON, W., 437, 440  
 Stimulus-reponse bond, 63  
 Stratification, social, 200, 331, 337 ff  
 Stress, 91, 113, 132, 152, 202  
   "Student's" method of estimating significance, 400  
 Subjectification, 150  
 Sublimation, 141, 142, 165  
 Submissiveness, 83, 315, 316  
 Suggestibility, 306, 311 ff.  
 Suggestion, 307 ff., 350  
 Superior-inferior relationship, 195, 315, 331 n.  
 Suppression, 138, 139, 144, 206, 284  
 Sympathetic emotions, 76, 77  
   — induction, 76, 84  
 Sympathy, 306, 313  
 Synapse, 64  
  
 TARDE, 314  
 Taste sensations, 228, 238  
 Teasing, 187  
 Telepathy, experiments on, 404  
 Temperament, 105 ff.  
   — tests, 427, 428  
 Tendency, 132  
 Tender emotion, 158 n.  
 Tension, *see* Stress

Terman, 422, 424  
 Tetrad difference, 433, 438  
 Theft, 354  
 Thermal sensibility, 227  
*The Waste Land*, 455  
 Thirst, 134, 135, 374  
 THOMAS and ZNANIECKI, 102  
 THOMSON, 434  
 THORNDIKE, 10, 51, 53 ff., 63, 67, 68, 421, 430, 450  
 Thought, 245 ff.  
 — processes, experimental investigation of, 9, 253 ff.  
 THURSTONE, 439  
 Time, 243  
 TITCHENER, 294  
 Toad, feeding behaviour of, 26  
 Tobacco smoking, 135, 139  
 TOLMAN, 242  
 Touch, 227  
 Trace, memory, 253, 268  
 Tragedy, 474  
 Traits, 108  
 Transformation, 138 ff., 187, 193 ff.  
 Transitoriness of instincts, 98  
 Trial and error behaviour, 22, 52 n.  
 — — — learning, 49, 52 ff., 245  
 — marriage, 161  
 Tridimensional theory of feeling, 91  
 Trobriand Islands, 160, 168, 172, 335  
 Tropism, 21 ff.  
 TROTTER, 247  
 Twins, identical, 421  
 Two-factor theory of intelligence, 431 ff.  
  
 UNCONSCIOUS, the, 7, 140  
 Unconditioning, 71  
 Unemployment, 217  
 Unitary capacities, 418  
 UNWIN, 147 ff., 161, 162, 488  
 Urgency of wants, 366  
 U S A, social classes in, 340, 341

U.S.S.R., 354, 357  
 Utility, 372 ff.

VALENCES, 136, 360 n., 368  
 VALENTINE, 462  
 Values, economic, 359 ff.  
 VARENDONCK, 274  
 Verbal ability, 425, 437  
 — and factual problems in psychology, 14 ff., 119  
 — thinking, 226, 254  
 VERNON, P. E., 408  
 Vindictiveness, 356  
 Violence, crimes of, 354  
 Visual imagery, 249  
 Vocational tests, 417  
 Volition, 66, 128, 129, 288 ff., 348  
 VON HÜGEL, 492

WAGNER, 469, 470, 473  
 Wants, 360, 366  
 Warfare, 82, 124, 138, 144, 189 ff., 321, 381, 382, 387  
 WATSON, J. B., 4, 70 ff., 119, 121, 173, 254  
 WEBB, 438  
 WEISMAN, 61  
 WERTHEIMER, 12  
 WESTERMARCK, 239 ff., 348  
 WHATELY, 81  
 WIESNER, 86, 133, 135, 167  
 Will, *see* Volition  
 WINGFIELD, 421  
 Wish fulfilment, 274, 475  
 Wit, 201, 204  
 Witchcraft, 118  
 Wordsworth, 470  
 Work, 213, 215 ff.  
 WUNDT, 91

YERKES, 168 n., 216  
 Yoga, 293

ZUCKERMAN, 38  
 Zuni Indians, 165